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NORTH CAROLINA ATOMIC ENERGY
ADVISORY COMMITTEE

REPORT

September 1, 1961 - December 31, 1962.

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

CHAIRMAN:
AGNEW H. BAHNSON, JR.
P. O. BOX 367
WINSTON-SALEM

January 7, 1963

The Honorable Terry Sanford
Governor of North Carolina
Raleigh, North Carolina

Dear Governor Sanford:

I have the honor to transmit herewith a report of the activities of the North Carolina Atomic Energy Advisory Committee during the sixteen months ending December 31, 1962.

My active association with the North Carolina Atomic Energy Advisory Committee as Chairman commenced September 1, 1961 but I was out of the United States for seventy-five days on a round-the-world trip during the Fall of 1961.

The memberships of the Committee and its statutory subcommittees are listed in Addendum I and II.

The Act* under which this Committee was set up, and which has guided its efforts, states,

"The Committee shall evaluate studies, recommendations, and proposals of the several departments and agencies and shall

*(G.S. 104C-3; 1959, c.481, s.3)

EX OFFICIO MEMBERS:
L. Y. BALLENTINE, RALEIGH • CHARLES F. CARROLL, RALEIGH • J. W. R. NORTON, RALEIGH

OTHER MEMBERS:
ATWELL ALEXANDER, STONY POINT • KILLIAN BARWICK, ELIZABETH CITY • C. E. BOULWARE, DURHAM • JOHN C. BRAUER, CHAPEL HILL
C. C. CARPENTER, WINSTON-SALEM • EMIL T. CHANLETT, CHAPEL HILL • HENRY T. CLARK, JR., CHAPEL HILL • J. C. COWAN, JR., BURLINGTON
FRANK CRANE, RALEIGH • WILBUR H. CURRIE, CARTHAGE • WILBURT C. DAVISON, DURHAM • GERALD EDWARDS, GREENSBORO • E. C. FISS, CHARLOTTE
PAUL GROSS, DURHAM • WILLIAM F. HENDERSON, RALEIGH • J. J. HILL, CHARLOTTE • JOHN I. HOPKINS, DAVIDSON • H. BROOKS JAMES, RALEIGH
LEO W. JENKINS, GREENVILLE • EDWIN L. JONES, CHARLOTTE • T. H. LECROY, ROCKY MOUNT • A. C. MENIUS, JR., RALEIGH
ROBERT J. REEVES, DURHAM • H. B. ROBINSON, RALEIGH • WILLIAM P. SAUNDERS, RALEIGH • FORREST H. SHUFORD, II, RALEIGH • M. I. SHUFORD, JACKSONVILLE
E. JACK STORY, RALEIGH • WILLIAM M. WHYBURN, CHAPEL HILL • WILLIAM L. WILSON, RALEIGH

Established 1959 under provisions of Chapter 481, Session Laws of 1959

act as an advisory and coordinating group in the development and regulatory activities of the State relating to atomic energy, including co-operation with other states and with the government of the United States. The Committee shall advise with the Governor for the purpose of keeping him informed as to private and public activities affecting atomic developments."

"So far as may be practicable, the Committee shall co-ordinate studies, recommendations and proposals with like activities in other states and in the South as a region, and with the policies and regulations of the United States Atomic Energy Commission."

Although no dramatic opportunities have been uncovered for profitably expanding the uses of atomic energy in North Carolina, we do believe that worthwhile progress has been made by the Committee during the year of 1962 in accordance with our responsibilities as set forth by law. At present, North Carolina's greatest opportunities appear to be in the realms of education, research, agricultural applications (including food processing), medicine, and public health.

The following statement of progress is abbreviated with the knowledge that the Governor may call upon the Committee for those details desired which are not clearly amplified by addenda:

1. The Committee has recommended unanimously the passage in the forthcoming legislature of an appropriate successor to the 1961 H.B. 1028 (Addendum III). This would enable the Governor to sign agreements with the United States Atomic Energy Commission under

provisions of Public Law 86-373 and authorize the State Board of Health to assume responsibilities for State licensing and regulatory activities for the State generally recognized as essential to equitable State progress in this field. Kentucky was the first state to qualify for accepting such responsibility from the United States Atomic Energy Commission. California, Mississippi and New York have received similar authorizations. Texas has submitted a proposal which will take effect during January, 1963. Several other states are ready to do so. H. B. 1028 was passed by the House but rejected in late Senate action of the 1961 Legislature.

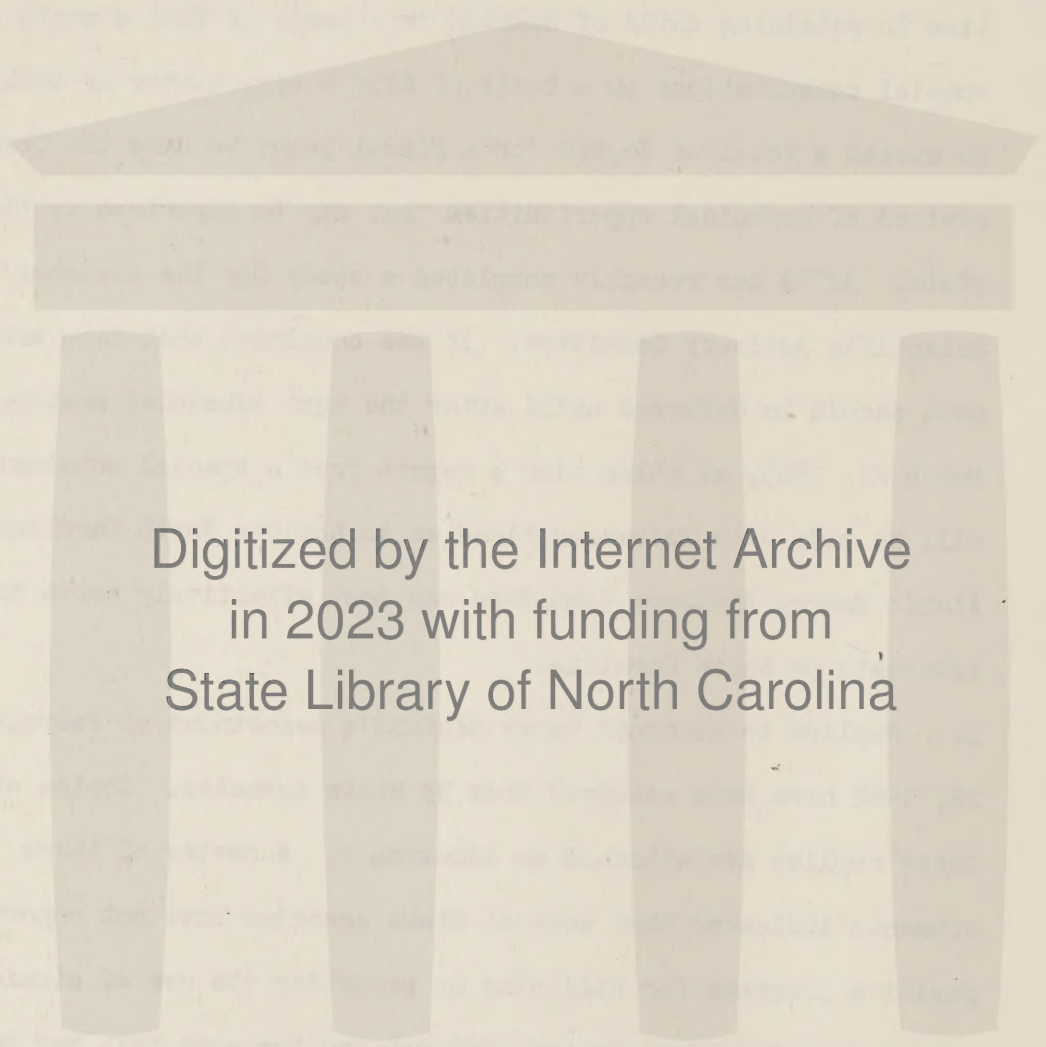
2. The North Carolina Atomic Energy Advisory Committee, after careful deliberation, declined to make a positive recommendation at this time regarding the State of North Carolina enacting legislation such as the 1961 H.B. 1031 to formally join the Southern Interstate Nuclear Board. A special committee has been appointed to develop a program which may serve as an alternate to this action. Although joining the Southern Interstate Nuclear Board may enhance our opportunity for co-ordinating studies, recommendations and proposals with like activities in other states and in the south as a region, as prescribed by law, it is felt that this action may not be necessary to develop an aggressive program within the State of North Carolina.

3. The recommendations of the Committee with reference to budgetary requests, have been submitted separately, with a copy attached as Addendum IV.

4. The Committee gave consideration to a full-time advisory assistant to the Committee and concluded that such action should be deferred for at least six months. It likewise gave consideration to retaining ASTRA of Raleigh on a basis of \$300 a month plus special consultations on a basis of \$150 a day, either or both not to exceed a total of \$6,000 for a fiscal year, to keep the Committee advised of technical opportunities that may be important to the state. ASTRA has recently completed a study for the Governor's Scientific Advisory Committee. It was concluded that this arrangement should be deferred until after the next scheduled meeting, March 21, 1963, at which time a report from a special subcommittee will be made with recommendations as to how the North Carolina Atomic Energy Advisory Committee can most effectively serve the interests of North Carolina.

5. Replies to Governor Terry Sanford's memorandum of February 28, 1962 have been received from 33 State agencies. Copies of these replies are attached as Addendum V. A review of these comments indicates that several State agencies have not reported positive programs for utilizing or promoting the use of atomic energy, as visualized by the 1959 Act and for some this may be indicated. Several educational institutions, the Department of Water Resources, the State Civil Defense Agency, and the State Board of Health are exceptions.

The State Board of Health has initiated and is proceeding carefully with development of a sound State Radiological Health Program. Positive efforts by the Board to co-ordinate this program with every other State agency to avoid unnecessary duplications and overlaps of jurisdiction and expense have been reported



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regularly to the Committee. The Governor, Council of State, and the Department of Administration have maintained encouraging interest in this activity and assisted the Board in its long-range health program projected up to June 30, 1967.

6. A report by the Subcommittee on Agriculture is attached (Addendum VI). The areas of primary concern to this Subcommittee are: (1) Understanding direct effects of ionizing radiation on plant and animal materials; (2) The "food chain" relationships, between soil, plant, water sources, and atmosphere in the production of food; (3) Understanding problems associated with procedures and practices of nuclear waste disposals because of their effects upon plants, animals, and other materials; (4) All citizens must be more adequately informed about radiation, and this at all levels of the total educational system. Certain implementing activities which have already been undertaken by groups outside the Committee are listed in the attached report.

7. A report on Radiation Standards dated January 22, 1962 is attached (Addendum VII). The provision of technical facilities and staff to initiate those measures which will permit the continuing of reasonable surveillance and regulatory control over radiation hazards was made possible January 29, 1962 when allotment of funds from the Governor's Contingency and Emergency Fund to the State Board of Health was approved by the Council of State and Governor Terry Sanford. Such hazards must have the increasing attention of experts by means of scientific surveillance over not only the State's general environment, but also occupational exposures and radiological incidents or accidents. Other State

agencies are expected to have significant contributions to make to this program.

Prompt action must be taken immediately when serious radiation hazards are created in the general environment, occupational environments, or at scenes of accidents involving radioactive materials.

Fallout from atmospheric weapons testing has emphasized the fact that the creation of some potential hazards is well outside our State control, yet health protection must be provided. While countermeasures are based upon health effects upon man, other animals and agricultural products, countermeasures will require extensive co-ordination of planning and implementing such measures by not only State agencies but community groups as well.

8. With continuing testing in the atmosphere, fallout surveillance on a reliable basis is becoming a paramount consideration. The Committee has adopted unanimously the following measures in this connection:

(1) The Medicine and Public Health Subcommittee will accept responsibility for:

Keeping closely informed by the State Health Director of the changing facts, factors, and status of fallout, fallout surveillance, effectiveness of surveillance, countermeasures recommended, and effectiveness of countermeasures in North Carolina.

Presenting to the Committee Chairman those recommended interim and quarterly actions by the Committee which are deemed necessary to be taken henceforth with reference to fallout and fallout surveillance.

(2) The Committee will express any recommendations to the

State Board of Health of additional action(s) the Committee considers the Board may take, to meet the Board's responsibilities related to fallout surveillance, and countermeasures made urgently necessary by fallout.

(3) The Committee, through timely letters signed by the Committee Chairman to the Governor, members of the Advisory Budget Commission, and the General Assembly, will report the results of the Atomic Energy Advisory Committee's evaluation of each significant study, recommendation, and proposal, related to fallout.

9. The Committee has approved a report and recommendations from the Subcommittee on Medicine and Public Health originally submitted in January, 1962 but expanded more recently (Addendum VIII):

(1) That a symposium concerning the clinical uses of radioisotopes be instituted. Such a symposium should stress the hows and whys of clinical radioisotopes, and be directed primarily toward the private and/or small clinic physician.

(2) That information relative to medical radioisotope courses currently conducted within North Carolina be assembled and disseminated appropriately, together with data on radioisotope courses available to medical technicians.

(3) That a complete nuclear medicine center, to include a medical research reactor and radioisotope processing facility, be considered for North Carolina.

10. A report from the Subcommittee on Power is attached (Addendum IX).

There is little immediate opportunity for significant expanded activity in atomic energy developments related to the power field in the State. Such activity in North Carolina appears to be uneconomic at present and may be several years off. The Committee has considered recently optimistic reports that economically practical power reactors are likely to be feasible for construction between the years 1967 and 1970.

11. A report from the Subcommittee on Industry & Labor has been approved by the Committee and is attached (Addendum X).

Mr. M. L. Shepherd has been designated by the Director, Department of Conservation and Development, to attend the meetings of our Committee. In addition to the major State policy to protect and promote the health of North Carolina citizens where atomic energy is involved, there is a second State policy to create an environment favorable for promoting maximum beneficial expansion of atomic energy activities in North Carolina. This is essential if we are to provide new jobs, compete successfully with other States, and improve the economic well-being of North Carolina. The Department of Conservation and Development has stated that they will make available through Mr. Shepherd their total resources available to pursue any opportunities of this nature which might be developed by the Committee.

The Subcommittee on Industry and Labor plans to maintain liaison with the Nuclear Energy Commission of the National Association of Manufacturers and the United States Chamber of Commerce, with special attention to federal legislation in the atomic energy field.

12. A specific activity instituted by the Committee, assisted by the Southern Interstate Nuclear Board and the United States Atomic Energy Commission, and convened as a result of co-ordination by the North Carolina State Ports Authority, has resulted in a helpful conference at Wilmington, North Carolina, December 3, 1962. The conferees explored the manner in which the ports of Wilmington and Morehead City might qualify to receive spent atomic fuel elements from abroad which will be shipped to the United States to be reprocessed. Six ports in the United States have reported they will accept such shipments, Philadelphia, Norfolk, Charleston, Savannah, Port Everglades, and Seattle. Since each element usually comprises only 15 tons gross weight the pattern of import port calls can be influenced materially by clearance of this item. The Committee Chairman was informed as the year ended that the Community of Wilmington has submitted its resolution to the United States Coast Guard that Wilmington Port accept this type of shipment.

This is an example of co-ordinating intra-state, regional, and State-Federal activity within the province of the Committee which can contribute to the industrial growth of North Carolina. In addition the primary necessity for providing for the public health and safety were highlighted.

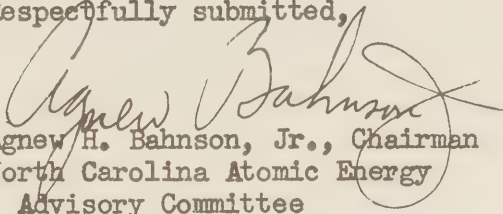
13. A major responsibility of this Committee is to keep the Governor advised on nuclear energy activities of other states, especially Southern states, and to co-ordinate the activities in

January 7, 1963

North Carolina with those of other states where it is to the best interest of our state. Attached is Addendum XI regarding nuclear energy activities in the states of Florida, Kentucky and New York, as well as reports made by several states at the April 11th and 12th, 1962 meeting of the Southern Interstate Nuclear Board.

Each member of this Committee will be furnished a copy of this report to you. I shall be pleased to have your guidance as to any other distribution you desire.

Respectfully submitted,


Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy
Advisory Committee

AHBjr/s

Attachments

1 November 1962

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

Established Under Provisions of
Chapter 481, Session Laws of 1959
(Date Each Commission Expires is Shown)

CHAIRMAN:

Mr. Agnew H. Bahnson, Jr., President
The Bahnson Company
P. O. Box 367, Salem Station, 1967
Winston-Salem

EX OFFICIO MEMBERS:

Mr. L. Y. Ballentine
Commissioner of Agriculture
Raleigh

Dr. J. W. R. Norton
State Health Director
Raleigh

Dr. Charles F. Carroll
Superintendent of Public Instruction
Raleigh

OTHER MEMBERS:

Mr. Atwell Alexander
Alexander Poultry Farm 1967
Stony Point

Dr. Clifton E. Crandell
School of Dentistry 1963
University of North Carolina
Chapel Hill

Mr. Killian Barwick 1967
Elizabeth City

Mr. Frank Crane
Commissioner of Labor 1965
Raleigh

Dr. C. E. Boulware
Professor Mathematics
North Carolina College 1967
Durham

Dr. Lauchlin M. Currie
Director of Development 1965
Research Triangle of North Carolina
30 East 42nd Street
New York, New York

Dr. C. C.-Carpenter, Dean
Bowman Gray School of Medicine
Winston-Salem 1965

Dr. Gerald Edwards, Chairman
Department of Chemistry 1967
North Carolina Agricultural
& Technical College
Greensboro

Professor Emil T. Chanlett, Dean
School of Public Health 1963
University of North Carolina
Chapel Hill

Dr. Henry T. Clark, Administrator
Division of Health Affairs 1963
University of North Carolina
Chapel Hill

Mr. E. C. Fiss
Duke Power Company 1965
Charlotte

- S E E R E V E R S E -

Dr. Paul Gross, Vice President
Duke University 1965
Durham

Mr. William F. Henderson
Executive Secretary 1963
North Carolina Medical Care Commission
Raleigh

Mr. J. J. Hill, Manager
Carolinas District 1963
Westinghouse Electric Corporation
Charlotte

Dr. John I. Hopkins
Davidson College 1967
Davidson

Mr. John V. Hunter, III, Attorney
440 West Market Street 1967
Greensboro

Dean H. Brooks James
School of Agriculture 1965
North Carolina State College
Raleigh

Mr. A. L. Jameson
Vice President 1968
Virginia Electric and Power Co.
Williamston

Dr. Leo W. Jenkins, President
East Carolina College 1963
Greenville

Mr. Edwin L. Jones 1965
J. A. Jones Construction Co.
Charlotte

Mr. T. H. LeCroy
1001 Sunset Avenue 1963
Rocky Mount

Dr. A. C. Menius, Jr., Dean
School of Physical Sciences
& Applied Mathematics 1965
North Carolina State College
Raleigh

Dr. Robert J. Reeves
Professor of Radiology 1965
Duke University
Durham

Mr. H. B. Robinson
Vice President and General Manager
Carolina Power & Light Company 1963
Raleigh

Mr. William P. Saunders 1965
910 E. Massachusetts Avenue
Southern Pines

Mr. Forest H. Shuford, II 1967
North Carolina Industrial Commission
Raleigh

Brig. General M. I. Shuford
Jefferson Standard Life Insurance
Company 1967
Jacksonville

Mr. E. Jack Story, Director
Nuclear Reactor Project 1963
North Carolina State College
Raleigh

Mr. Nello L. Teer, Jr.
P. O. Box 1131 1963
Durham

*Dr. William L. Wilson,
Assistant Director 1967
Division of Epidemiology
Radiological Health
State Board of Health
Raleigh

Dr. M. Barnes Woodhall, Dean
School of Medicine 1965
Duke University
Durham

4 January 1963

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE
SUBCOMMITTEES

Established Under Provisions of
Chapter 481, Session Laws of 1959
(Date Each Commission Expires is Shown)

SUBCOMMITTEE ON
AGRICULTURE

Dean H. Brooks James	1965
Chairman	
Mr. Atwell Alexander	1967
Mr. L. Y. Ballentine	Ex Officio
Mr. Killian Barwick	1967
Mr. T. H. LeCroy	1963

SUBCOMMITTEE ON
MEDICINE & PUBLIC HEALTH

Dr. M. Barnes Woodhall	1965
Chairman	
Dr. C. C. Carpenter	1965
Prof. Emil T. Chanlett	1963
Dr. Henry T. Clark, Jr.	1963
Dr. Clifton E. Crandell	1963
Dr. Gerald Edwards	1967
Mr. William F. Henderson	1963
Dr. J. W. R. Norton	Ex Officio
Mr. E. Jack Story	1963

SUBCOMMITTEE ON
EDUCATION AND RESEARCH

Dr. Paul Gross	1965
Chairman	
Dr. Charles F. Carroll	Ex Officio
Dr. Lauchlin M. Currie	1965
Dr. John I. Hopkins	1967
Dr. Leo W. Jenkins	1963
Mr. E. Jack Story	1963
Dr. M. Barnes Woodhall	1965

SUBCOMMITTEE ON
POWER

Mr. H. B. Robinson	1963
Chairman	
Mr. E. C. Fiss	1965
Mr. J. J. Hill	1963
Mr. John V. Hunter, III	1967
Brig. Gen. M. I. Shuford	1967
Mr. A. L. Jameson	1968

SUBCOMMITTEE ON
INDUSTRY & LABOR

Mr. Edwin L. Jones	1965
Chairman	
Dr. C. E. Boulware	1967
Mr. Frank Crane	1965
Mr. William P. Saunders	1965
Mr. Forrest H. Shuford, II	1967
Mr. Nello L. Teer, Jr.	1963

SUBCOMMITTEE ON
RADIATION STANDARDS

Dr. A. C. Menius, Jr., (Nuclear Physicist)	1965
Chairman	
Prof. Emil T. Chanlett (Sanitary Engineer)	1963
Dr. Clifton E. Crandell (Dentist)	1963
Dr. Robert J. Reeves (Radiologist)	1963
Mr. E. Jack Story (Radiation Physicist)	1963
Dr. William L. Wilson (Public Health Physician)	1967

COMMITTEE CHAIRMAN: Mr. Agnew H. Bahnson, Jr.
P. O. Box 367, Salem Station,
Winston-Salem, North Carolina

COMMITTEE SECRETARY: William L. Wilson, M. D.
P. O. Box 2091
Raleigh, North Carolina

INTRODUCED BY:

Referred to:

1 A BILL TO BE ENTITLED AN ACT AMENDING CHAPTER 104C OF THE
2 GENERAL STATUTES, RELATING TO ATOMIC ENERGY, RADIOACTIVITY
3 AND IONIZING RADIATION.

4 The General Assembly of North Carolina do enact:

5 Section 1. G. S. 104C-4, as the same appears
6 in the 1959 Cumulative Supplement to the General Statutes,
7 is hereby amended by adding the following paragraph imme-
8 diately following the first paragraph thereof:

9 "The State Board of Health is authorized to
10 require the licensing of all persons, firms, corporations,
11 associations or institutions who possess, use, store, trans-
12 port or dispose of such machines or materials, such licensing
13 program to be of such scope and in such form as the Board
14 deems necessary to provide an adequate protection and
15 supervision program. Said Board is authorized to adopt reason-
16 able rules and regulations necessary to carry out an effective
17 licensing program designed to protect the public health or
18 safety in this field. Provision shall be made for applica-
19 tions for licenses, conditions for issuance of licenses, and
20 suspension and revocation of licenses. Said State Board is
21 authorized to exempt certain sources of ionizing radiation
22 or kinds of uses or users from the licensing or registration
23 requirements set forth in this section when the said State
24 Board makes a finding that the exemption of such sources of

1 ionizing radiation or kinds of uses or users will not
2 constitute a significant risk to the health and safety of
3 the public. Rules and regulations promulgated pursuant to
4 this Article may provide for recognition of other state or
5 federal licenses as the said State Board may deem desirable,
6 subject to such registration requirements as the said State
7 Board may prescribe. Insofar as practicable, all the pro-
8 visions of Chapter 150 of the General Statutes shall be
9 applicable with respect to licenses and the licensing
10 procedure herein provided for."

11 Sec. 2. Chapter 104C of the General Statutes is
12 hereby further amended by adding a new section at the end
13 thereof, to be designated as G. S. 104C-5, and to read as
14 follows:

15 "G. S. 104C-5. Governor authorized to enter into
16 agreements with Atomic Energy Commission.--(a) The Governor,
17 on behalf of this State, is authorized to enter into agree-
18 ments with the federal government providing for discontinu-
19 ance of certain of the federal government's responsibilities
20 with respect to sources of ionizing radiation and the
21 assumption thereof by this State.

22 "(b) Any person who, on the effective date of an
23 agreement under subsection (a) above, possesses a license
24 issued by the federal government shall be deemed to possess
25 the same pursuant to a license issued under this Article,
26 which shall expire either ninety (90) days after receipt from
27 the State Board of Health, of a notice of expiration of such
28 license, or on the date of expiration specified in the federal

1 license, whichever is earlier."

2 Sec. 3. All laws and clauses of laws in conflict
3 with this Act are hereby repealed.

4 Sec. 4. This Act shall become effective upon
5 its ratification.

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NORTH CAROLINA
STATE BOARD OF HEALTH

RALEIGH

MEMBERS

CHARLES R. BUGG, M. D., PRES.	RALEIGH
JOHN R. BENDER, M. D., VICE-PRES.	WINSTON-SALEM
BEN W. DAWSEY, D. V. M.	GASTONIA
LENOX D. BAKER, M. D.	DURHAM
ROGER W. MORRISON, M. D.	ASHEVILLE
JASPER C. JACKSON, PH. G.	LUMBERTON
OSCAR S. GOODWIN, M. D.	APEX
GLENN L. HOOPER, D. D. S.	DUNN
D. T. REDFEARN	WADESBORO

J. W. R. NORTON, M. D., M.P.H.
STATE HEALTH DIRECTOR
AND
SECRETARY-TREASURER

COPY

JACOB KOOMEN, JR., M. D., M.P.H.
ASSISTANT STATE HEALTH DIRECTOR

December 18, 1962

COPY

The Honorable Terry Sanford
Governor of North Carolina
Raleigh, North Carolina

Dear Governor Sanford:

At our scheduled meeting December 13, 1962 the North Carolina Atomic Energy Advisory Committee authorized me to transmit to you for budgetary purposes a statement of funds we would require for Committee activities during the Biennium 1963-1965.

I attach our proposed budget totaling \$8,700 per year, or a combined total of \$17,400 for the Biennium.

The above figure does not include the annual contribution by the State of North Carolina to the Southern Interstate Nuclear Board, which I understand has previously been budgeted by the Governor. The annual contribution to date is \$3,846.97 as North Carolina's portion.

We would appreciate your favorable action with reference to this budget. If I need to do anything further about it, please guide me.

Very truly yours,

(SIGNED) Agnew H. Bahnson, Jr.
Chairman

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AEAC

	<u>1963-1964</u>	<u>1964-1965</u>	<u>Total</u>
Supplies and Materials	\$ 300.00	\$ 300.00	\$ 600.00
Memberships & Subscriptions	300.00	300.00	600.00
Postage, Telegraph, Telephone and Express	300.00	300.00	600.00
Travel	600.00	600.00	1,200.00
Printing	200.00	200.00	400.00
Consultation Fees	7,000.00	7,000.00	14,000.00
TOTAL	<u>\$8,700.00</u>	<u>\$8,700.00</u>	<u>\$17,400.00</u>

Not included SINB - \$3,846.97

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NORTH CAROLINA

STATE BOARD OF HEALTH

RALEIGH

MEMBERS

CHARLES R. BUGG, M. D., PRES.	RALEIGH
JOHN R. BENDER, M. D., VICE-PRES.	WINSTON-SALEM
BEN W. DAWSEY, D. V. M.	GASTONIA
LENOX D. BAKER, M. D.	DURHAM
ROGER W. MORRISON, M. D.	ASHEVILLE
JASPER C. JACKSON, PH. G.	LUMBERTON
OSCAR S. GOODWIN, M. D.	APEX
GLENN L. HOOPER, D. D. S.	DUNN
D. T. REDFEARN	WADESBORO

J. W. R. NORTON, M. D., M.P.H.
STATE HEALTH DIRECTOR
AND
SECRETARY-TREASURER

29 June 1962

JACOB KOOMEN, JR., M. D., M.P.H.
ASSISTANT STATE HEALTH DIRECTOR

MEMORANDUM

TO: Members, North Carolina Atomic
Energy Advisory Committee

FROM: W. L. Wilson, M. D.
Secretary for the Committee' *W L W*

SUBJECT: (1) Replies from State Department, Agency, and Institution
Heads to Memorandum from Governor Terry Sanford,
February 28, 1962 (Copy attached)

(2) Informational Materials Relative to Southern Interstate
Nuclear Board - Available to Members upon Request

Herewith copies of statements received from 32 agency heads
as a result of Governor Sanford's memorandum dated February 28, 1962.
No others have been received to date.

Informational materials, of the type previously mailed, but
perhaps now misplaced, are available for any Committee member who sends
the Secretary a request or for replacement of such concerning the Southern
Interstate Nuclear Board. This includes a copy of the Compact, a listing
of the Southern Interstate Nuclear Board and Advisory Committee memberships,
and a listing of objectives of the Board.

It is recommended that any interested member request his United
States Senator or Representative member of the Congress to furnish a copy
of Hearing Before Subcommittee No. 3, Committee on the Judiciary, House of
Representatives, Eighty-Seventh Congress, and H.R. 7498 and H.R. 7466,
Southern Interstate Nuclear Compact, July 13, 1961, Serial No. 24. This
includes very informative statements, reflecting Federal Agency attitudes
on the Compact as well as States' activities.

WLW:nh

COPY

STATE OF NORTH CAROLINA

GOVERNOR'S OFFICE

February 28, 1962

MEMORANDUM

TO: Heads of State Departments, Agencies and Institutions

FROM: Terry Sanford, Governor

The Atomic Energy Act of 1959 identified the State's objectives relating to atomic energy, radioactivity and ionizing radiation in a declaration of policy. The Act placed responsibilities upon many of us which we need to consider more positively and to implement more aggressively than has been done up to now.

Recently Mr. Agnew H. Bahnson, Jr., of Winston-Salem was appointed Chairman of the Atomic Energy Advisory Committee, replacing the late Mr. W. D. Carmichael, Jr. Mr. Bahnson has pointed out that the Committee has some responsibilities that can be met only after prior actions by the Governor and those addressed above. For example, the Committee has not been able to evaluate studies, recommendations and proposals relating to atomic energy, as prescribed by the Act, since they have not been submitted; indeed they have not previously been requested of you. Therefore, sufficient advisory or co-ordinating activity by the Committee has not been feasible.

It would be helpful if you will take very prompt steps to forward a report reflecting any activities by your agency up to 31 December 1961 under the cited Act, furnishing it in triplicate to the Chairman, North Carolina Atomic Energy Advisory Committee, P. O. Box 2091, Raleigh. The report should include as a minimum, a statement of:

1. Studies your staff have undertaken to increase maximum beneficial uses of atomic energy in North Carolina
2. Their activities to encourage and increase atomic energy sources in the State
3. Your appraisal of the specific benefits or failures from each study and activity listed
4. Your recommendations and proposals designed to help expedite any and all desirable actions the Act mentions, envisions, or requires.

I have asked the Committee Chairman to follow up on this matter energetically to reduce the disadvantages created by past delays. To assist him, please forward your comments on the opportunity for activities by your agency in the future even if there have been no activities to date. In addition, please designate one person of your staff by name and title who will serve as your liaison to the Committee on all matters charged to that Committee.

COPY

- 2 -

I am sure you realize that not only I, but Mr. Bahnson, will be grateful for any suggestions you may offer which would help the State compete favorably in all beneficial uses of atomic energy. Raleigh and nearby agencies may contact the Committee's Secretary, Dr. W. L. Wilson, TE 4-3611, extension 680 or 689 for prompt clarification or other desired assistance by the Committee.

TS:r

COPY

DEPARTMENT OF ADMINISTRATION

March 28, 1962

MEMORANDUM

TO: The Chairman, North Carolina Atomic Energy Advisory Committee

FROM: Hugh Cannon, Director, Department of Administration

RE: Report of activity of the Department of Administration with respect to the Atomic Energy Act of 1959, and made pursuant to the memorandum of Governor Terry Sanford dated February 28, 1962.

1. The staff of the Department of Administration is not competent to conduct studies of a direct nature concerning the use of atomic energy. Any studies the staff made would be of an informational nature relating primarily to fiscal matters, facilities, supplies and materials, and the like. No such studies have been conducted as of the present time.
2. None.
3. No response indicated.
4. The Department of Administration has stood ready, willing and able to cooperate with any and all State agencies in implementing plans and projects designed to carry into effect the State policy declared in the Act. The State Board of Health has been actively engaged in carrying out the policy expressed in the Act, and the Department of Administration has given its cooperation in these efforts by taking the necessary fiscal action required to assist the Board in its efforts.

COPY

REPORT OF ACTIVITIES AT
THE AGRICULTURAL AND TECHNICAL COLLEGE OF NORTH CAROLINA
RELATING TO ATOMIC ENERGY AND ITS APPLICATIONS

This report follows the outline of the memorandum from Governor Sanford with headings taken from the statements therein about which information was requested.

1. Studies which the staff at A. and T. College have undertaken to increase maximum beneficial uses of atomic energy in North Carolina

Radioactive tracers have been used in two basic research projects. In one of these, several years ago, the radioactive tracers were used in studying the contamination of milk by the bitter principle resulting from the eating of bitter weed by cattle. As the eating of bitter weed by cattle results in financial losses in the dairy industry, solution of this problem would have important practical results. Dr. Booker T. White conducted these experiments under a grant from the North Carolina Experiment Station.

In another project, now in its sixth year of operation, the utilization of an important amino acid constituent of protein, methionine, is studied using radioactive tracers. This project could have important results in the understanding of nutrition. In related experiments with methionine, the effectiveness of this nutrient and compounds derived from it in the body in preventing or minimizing radiation damage to living organisms was investigated. These investigations are being conducted by Dr. Cecile H. Edwards, Miss Evelyn Gadsden, and Dr. Gerald A. Edwards under a grant sponsored by National Institutes of Health.

The College presently holds a contract with the United States Atomic Energy Commission to conduct research studies related to mammalian recovery following exposure to injurious dosages of X-irradiation. Investigations into the biochemical and immunological changes of experimental animals following administration of therapeutic materials such as bone marrow, liver, and spleen

cells from a variety of sources are being conducted. Principal investigators in this project are Dr. George C. Royal, Professor of Bacteriology; and Dr. Gladys Royal, Professor of Chemistry.

2. Activities to encourage and increase atomic energy sources in the State

A. and T. College has added to its curriculum two courses in Radiochemistry and Radioisotope Techniques which will be available to its students and other interested persons in the community. The College has received a grant from the Atomic Energy Commission to purchase the necessary equipment for a Radiochemistry Laboratory. In addition, the annex to the Chemistry Building will include a well-planned radiochemistry Laboratory and storage area for radioactive sources. It is anticipated that through these courses greater interest in atomic energy and understanding of its applications may be fostered. It is hoped that the stockpile of persons trained in the handling and uses of radioactive materials will be increased to some extent. In connection with these courses, lecturers from the Oak Ridge National Laboratory will be invited to give seminars open both to students and the general public.

3. Appraisal of the specific benefits or failures from each study and activity listed

The value of basic research can never be accurately measured even when practical results are expected. It would, therefore, be difficult to measure the specific benefits of these activities. It is anticipated, however that the training program will be of definite value to the individuals involved and to the State as a whole by making available additional personnel who can use radioactive materials.

4. Recommendations and proposals

It is recommended that the Colleges be kept informed of those activities of the Committee which may be of interest to educational institutions.

Respectfully submitted,

LCD:lcp
April 20, 1962

L. C. Dowdy, Acting President

COPY

STATE OF NORTH CAROLINA
DEPARTMENT OF AGRICULTURE

March 27, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
N. C. Atomic Energy Advisory Committee
Post Office Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is in response to a memorandum dated February 28, 1962, from Governor Sanford to heads of State Departments, Agencies and Institutions.

I regret that I am unable to report any activities to encourage and increase atomic energy sources carried out by the North Carolina Department of Agriculture prior to December 31, 1961, under the Atomic Energy Act of 1959.

Sincerely yours,

(SIGNED)

L. Y. Ballentine

LYB:ch

cc: Governor Terry Sanford

COPY

APPALACHIAN STATE TEACHERS COLLEGE

March 12, 1962

Mr. Agnew H. Bahnson, Jr.
Chairman
North Carolina Atomic Energy Advisory Committee
Post Office Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

Several days ago we received a communication from Governor Sanford requesting that you be given a report reflecting any activities by Appalachian State Teachers College relating to atomic energy, radioactivity and ionizing radiation.

We have nothing to report as our staff has undertaken no studies in these areas nor has it engaged in activities designed to encourage and increase atomic energy sources in the State.

We anticipate that by the opening of school this coming fall we shall have on duty a chairman of the recently created department of physics. It will be our desire to appoint him liaison to your committee. We shall give you the necessary information after the appointment is made and he is on duty.

Sincerely yours,

(SIGNED) W. H. Plemmons

WHP:p

cc: Governor Terry Sanford
The Capitol
Raleigh, North Carolina

COPY

STATE OF NORTH CAROLINA
DEPARTMENT OF ARCHIVES AND HISTORY

March 14, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

Replying to the Governor's recent communication, the program of this Department is so different and distinct from the atomic energy field that we have nothing to report. We do, however, wish you every success in this program.

With cordial good wishes, I am

Yours sincerely,

(SIGNED)

Christopher Crittenden
Director

CC:cc

COPY

BROUGHTON HOSPITAL

Morganton, N. C.

March 16, 1962

Mr. Agnew H. Bahnson, Jr., Chairman,
Atomic Energy Advisory Committee,
Post Office Box 2091,
Raleigh, North Carolina.

Dear Mr. Bahnson:

In compliance with a directive from Governor Terry Sanford, dated February 28, 1962, this statement is being forwarded to you.

In order to reflect any activities at Broughton Hospital, Morganton, N. C., as cited under the Atomic Energy Act of 1959, I beg to advise that Broughton Hospital has not participated in or been involved in the use of Atomic Energy. This type of institution would not ordinarily have any such planned projects, unless further studies and investigations would establish the feasibility of such. I am not aware at this time of any research project to be established at Broughton Hospital in this field.

Cordially yours,

(SIGNED)

John S. McKee, Jr., M. D.,
Superintendent.

JSMcK/LB

CC: Dr. Eugene A. Hargrove,
Commissioner of Mental Health,
N. C. Hospitals Board of Control,
Post Office Box 70,
Raleigh, North Carolina.

COPY STATE OF NORTH CAROLINA
CIVIL DEFENSE AGENCY

June 20, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is in reply to Governor Terry Sanford's memorandum of February 28, 1962 requesting a summary report reflecting the State Civil Defense Agency activities up to December 31, 1961 under the Atomic Energy Act of 1959.

I know you and your Committee will recognize the fact that the ever-changing pattern of a State program for civil defense is dictated by the evolution of the national program and must accommodate itself to the policies and decisions promulgated by the Federal authorities and agencies. While all of us recognize the need for such federal activities, they do complicate our inclination, and they do delay us from time to time in our desires, to get on with the job of preparing and implementing a consistent and progressive State civil defense program.

All of the staff assigned responsibility for the State Radiological Defense Program is made up of State employees of the North Carolina State College, the State Board of Health, and the State Civil Defense Agency. Therefore, any normal daily program of statewide significance undertaken for the protection and maintenance of the health of our citizens in relation to excessive exposure to ionizing radiation in effect is basic to and must be integrated with our State Radiological Defense Program. For that reason, all of us realize your Committee has active members who are primarily responsible also in the respective realms mentioned. Hence, you can call upon them (Mr. E. Jack Story and Doctor William L. Wilson) to have amplifications and clarifications of the many details involved. Naturally, our own Agency staff is available and would be glad to join the Committee at anytime in pertinent conferences if you desire that they provide administrative and logistical details you may deem beneficial to your purposes.

The following restricts itself predominantly to simple and all too brief summary statements listed in the order of the numerical references found in the Governor's memorandum. There is little included in explanation, or as reasons for the actual statements. Of course, there are many related Civil Defense Programs, e.g., fall-out shelter, emergency food and water distribution, law enforcement, emergency hospital units. This report to you confines itself to the State Radiological Defense Program for which the State Civil Defense Agency is responsible.

1. STAFF STUDIES UNDERTAKEN

Responsibilities of the State Civil Defense Agency for Radiological Defense have had continuing study, some of which preceded the 1959 Act. This continuing study has resulted in:

1. The RADIOLOGICAL DEFENSE SERVICE ANNEX I
to the STATE OF NORTH CAROLINA OPERATIONAL SURVIVAL PLAN.

2. Establishment of a RADIOLOGICAL DEFENSE COMMAND POST for civil defense response to emergencies of the nature requiring such an office.

3. The equipping of the RADIOLOGICAL DEFENSE COMMAND POST.

4. The procurement, stocking and distribution of civil defense radiological monitoring and survey equipment to the maximum feasible degree under limitations existing as a result of the recommendations made by and actions authorized under the National Civil Defense Program (see Inclosure 1).

5. The training of civil defense radiological defense instructors (see Inclosure 2).

6. The establishment of field radiological monitoring and survey units (see Inclosure 3).

7. The establishment of barely minimal capabilities for radiological instrument inspection, testing, calibrating and repair shop facilities.

8. Establishment of a skeletal organization for area control and area reporting upon the nature and extent of radiological hazards within the respective area jurisdictions.

9. Computing the State's needs for improving and expanding to the reasonable degree necessary, the program which will insure our readiness to meet predictable demands, as limited by State and Federal policies, budgeting, and our own public response and support.

10. Annual practice alerts to permit staff activities to test, all too inadequately, the status of our program.

2. ACTIVITIES TO ENCOURAGE AND INCREASE ATOMIC ENERGY SOURCES IN THE STATE

Not applicable.

3. SPECIFIC BENEFITS OR FAILURES RESULTING FROM STUDIES MADE, AND REPORTED HEREIN

1. Staff members responsible for the Radiological Defense Program have so many normal and pressing daily responsibilities they cannot reasonably be expected to, nor have they been able to, maintain the RADIOLOGICAL DEFENSE SERVICE ANNEX L currently, to their own satisfaction. Furthermore, there are not sufficient funds to permit the clerical preparation, maintenance and distribution of this ANNEX even to the immediate staff concerned.

2. No valid experience factors have been possible to develop upon which to base an estimate of the effectiveness of the RADIOLOGICAL DEFENSE COMMAND POST.

3. The Command Post is thoroughly inadequate, but little can be done to change this situation while utilizing all currently available means.

4. Deficiencies with reference to the radiological monitoring and survey equipment cannot be remedied until the National Program takes on a consistent and dependable course.

5. To date the State has been able to train, sufficiently for the moment, all of its candidates for training responsibilities. On the other hand, fund limitations have prevented the adequate advertising and promotion of the existing training program, much less of any desirable expansion thereof.

6. Deficiencies in this facet of the Radiological Service can be attributed in part to those reasons stated in 1 and 5 above; however, the main difficulty has been a lack of instruments for assignment for Operational purposes to monitoring stations (see Inclosure 3).

7. All of our studies confirm beyond reasonable doubt that the State has no practical and adequate instrument maintenance and calibration program, nor is any currently in view, which will insure satisfactory function of the equipment we already have on hand (see Inclosure 1). Realistic appraisal of this matter by your Committee, as has been done by us, is likely to result independently in your own conviction, namely, that no delay in the actual establishment of such a State program is any longer economically sound. Furthermore, regardless of the economic aspect, the responsibility for any lack of serviceability of existing and predicted increasing numbers of instruments should be firmly established henceforth.

8. Little improved progress in establishing Area capability can be predicted until funds for implementation can be made available. A statewide estimate of capabilities and evaluation of performance is essential. However, this cannot be undertaken without financial means for doing it.

9. Only if sufficient resources can be assured to the current staff can an estimate of the State's needs be undertaken with reasonable effectiveness during the next biennium.

10. The State has had no control over the timing of annual practice alerts. As a result, it is regretted that there is little past improvement in this matter. National determination of test and alert periods has resulted in unnecessary disruption of personal and official responsibilities of our existing staff more than has been necessary. As a result, true evaluation has not been attained. In future, our own program can be improved only by more reasonable timing of tests. Furthermore, sufficient permanent staff must be available if any really effective preparation, conduct, and evaluation, of tests and alerts are to be visualized.

Mr. Agnew H. Bahnson, Jr.
June 20, 1962
Page 4

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4. PROPOSALS TO EXPEDITE DESIRABLE ACTIONS WHICH THE ACT MAINTAINS, ENVISIONS, OR REQUIRES THAT ARE PERTINENT TO THE STATE CIVIL DEFENSE AGENCY

Legislative action insuring adequate authorizations and sufficient funds specifically for the purposes of:

1. Qualified, minimal staffing of the State Civil Defense Agency Radiological Defense Command Post.

2. Minimal provision of functional plant facility and equipment and supplies essential to the Radiological Defense Command Post operations.

3. Maintenance and calibration of all radiological defense instruments.

4. Minimal staffing and training of Civil Defense Area Headquarters.

5. A statewide appraisal of our current and factually predictable readiness for Radiological Defense.

6. Informing our citizens soundly of the needs for, and measures potentially available for, insuring their personal survival in the face of radiation attack, to be attained by means of their own individual actions.

Sincerely yours,

(SIGNED)

Edward F. Griffin
Director

EFG:pas

PROCUREMENT STOCKING AND DISTRIBUTION
RADIOLOGICAL MONITORING AND SURVEY EQUIPMENT

Under the provisions of Advisory Bulletin No. 193 the Office of Civil Defense granted the following equipment to the State of North Carolina Civil Defense Agency for radiological training. This equipment is loaned to local civil defense organizations having licensed instructors for their use in training monitors. The number of sets of training equipment and what each set consist of are listed below:

QUANTITY	ITEM	CD NUMBER
----------	------	-----------

TWENTY TRAINING SETS

1	Demonstration Unit	V-457
10	Comparison standards, Food and Water	V-787
25	0-200 mr self-reading dosimeters	V-138
3	Dosimeter chargers	V-750
25	Geiger counters	V-700
25	Medium-range survey meters	V-710
10	High-range beta-gamma survey meters	V-720

THIRTY-FOUR RADIATION SOURCE SETS

12	0.5-5.0 mc Cobalt 60 sources (totaling 30 mc's)	V-786
1	Lead Container, small	V-791
1	Lead Container, medium	V-792
2	Locks for lead container	V-792
1	Long-handled tongs for handling sources	V-788
12	Radiation hazard signs	
2	0-200 mr dosimeters	V-138
1	Dosimeter charger	V-750
1	Geiger counter	V-700

TWENTY-SIX PRACTICE EXERCISE EQUIPMENT SETS

5	0-200 mr dosimeters	V-138
2	Geiger counters	V-700
2	Medium-range survey meters	V-710
1	High-range beta-gamma survey meters	V-720
2	0-20 r dosimeters	V-730
2	0-100 r dosimeters	V-740
2	Dosimeter chargers	V-750

Kits of instruments were issued to High Schools and Colleges requesting them for use in their science classes. Some of the kits are also used by the local civil defense organizations. A total of four hundred and twenty have been granted to North Carolina.

2	0-200 mr dosimeters	V-138
2	Survey Meters 0-0.5, 0-5, 0-50 mr/hr (Geiger Counter)	V-700
1	Survey Meter 0-0.5, 0-5, 0-50 r/hr	V-710
1	Survey Meter 0-5, 0-50, 0-500 r/hr	V-720
1	Dosimeter 0-20 r	V-730
1	Dosimeter 0-100 r	V-740
1	Dosimeter Charger, Portable	V-750
2	Comparison Standards, Food and Water	V-787
1	Instruction Manual on Instrument Usage	

COPY TRAINING OF CIVIL DEFENSE RADIOLOGICAL MONITORING INSTRUCTORS

The training of these instructors requires forty-two to sixty hours of instruction depending on where the course is taught. The course conducted by the Office of Civil Defense is forty-two hours. The colleges required more hours since college credit is given.

By December 31, 1961 one hundred and ninety (190) persons, representing fifty-eight counties, had been trained as follows:

Office of Civil Defense Schools	74
<u>Colleges</u>	
North Carolina State - Raleigh, N. C.	30
Warren Wilson College - Swannanoa, N. C.	9
East Carolina College - Greenville, N. C.	28
University of North Carolina - Chapel Hill, N. C.	28
Western Carolina College - Cullowhee, N. C.	6
Federal Agencies	15
TOTAL	190

Among the Instructors are:

State Highway Engineers	14
Highway Patrolmen	4
State Forester	1
Federal Agents	2
High School Teachers	70
Others (From all walks of life as volunteers at the local level)	99
TOTAL	190

Thirty-Five counties have secured licenses for one or more of their instructors; but some of those were inactive and did not conduct any monitor training courses last year. For this reason a good percentage of the counties had no trained monitors or monitoring stations established by 12-31-61.

COPY

ESTABLISHMENT OF FIELD RADIOLOGICAL MONITORING STATIONS

Federal Agencies have established forty-six monitoring stations in North Carolina. Local county, city and town civil defense organizations established seventy-one monitoring stations. This figure could have been much higher had the federal government provided the operational kits for these stations sooner since approximately one thousand monitors were trained. The seventy one stations established are located in twelve counties. The Federal Agencies having monitoring stations throughout the State are:

United States Department of Agriculture Soil Conservation Service	13
United States Weather Bureau	8
Federal Aviation Agency	12
United States Air Force Air Weather Service	2
United States Department of Agriculture Forest Service	3
United States Department of Agriculture Research Service	3
United States Navy Weather Service	1
United States Department of the Interior SF	2
United States Department of the Interior GS	1
United States Department of the Interior P	1
	<hr/> 46

Radiological Monitoring Instruments for Operational Purposes have been granted to the State of North Carolina Civil Defense Agency for Operational Purposes and loaned to the local civil defense organizations that had set up monitoring stations with at least two trained monitors each.

SEVENTY-ONE OPERATIONAL RADIOLOGICAL KITS

CD V-777

NUMBER	ITEM	CD NUMBER
1	Radiological Survey Meter, Geiger counter, probe type, beta-gamma discriminating 0-0.5, 0-5, and 0-50 mr/hr.	V-700
1	Radiological Survey Meter, gamma only 0-0.5, 0-5, and 0-50 r/hr	V-710
1	Radiological Survey Meter, beta-gamma discriminating 0-5, 0-50, and 0-500 r/hr	V-720
1	Radiological Dosimeter, self-reading, gamma only 0-20r.	V-730
1	Radiological Dosimeter, self-reading, gamma only 0-100r	V-740
1	Radiological Dosimeter Charger	V-750
2	Protective Masks (universal sizes)	V-860 or 870

Inclosure No. 3.

COPY

North Carolina Department of Conservation and Development
Report of Departmental Activity Under Authority
of The North Carolina Atomic Energy Act of 1959

A. Studies to increase uses of atomic energy in North Carolina

The Department of Conservation and Development has a very vital interest in all studies relating to atomic energy, as the outcome of such studies could have a very definite affect on one or more areas of responsibility over which the Department has jurisdiction. On the other hand, the opportunity for the Department to initiate a study and to pursue it to a successful completion has been rather limited; and up to this time, our efforts have been directed toward assisting those who are better equipped or in a better position to initiate such a study.

The actual studies which the Department has participated in or contributed to since passage of the Atomic Energy Act are as follows:

1. A joint venture of several major power generating companies in a pilot operation to produce electric power from an atomic energy installation. Studies relating to the possibility of this venture were undertaken during the calendar year 1960, and the Department contributed limited survey work to the interested parties. The parties interested in this venture, so we understand, finally located the project at Parr Shoals in South Carolina.
2. A private venture under AEC license to build a facility near Blewett Falls, North Carolina. The North Carolina interests were able to line up considerable research work for the proposed facility, but were not successful in obtaining a definite commitment from the government for work, prior to building the facility. The studies for this venture occurred over a several-year period in the late 1950's, and the Department was called upon to furnish certain limited survey information. This venture, we understand, was ultimately abandoned.
3. A feasibility study relative to the possible location of a reactor fuel processing facility in the State of North Carolina. In support of this study, representatives of the Department met with AEC officials in 1961 and provided considerable information on suitable locations in North Carolina.
4. Survey of site locations on a confidential basis for industry and government sponsored industries. The Department has been called upon to make a number of confidential site location studies, and it is believed that a number of the installations were in the atomic energy field.

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- 2 -

5. Use of the presence of the Nuclear Training Program along with the reactor, as a prime factor to endeavor to promote the State for private firms interested or engaged in this field. This information has been used to a prime advantage in encouraging new industry to locate in the State of North Carolina.

B. Activities to encourage and increase atomic energy sources in the State.

The Department has and will continue to do everything possible to encourage the establishment of industry within the State that may have an interest in or be related to atomic energy sources. In addition, the Division of Mineral Resources, during the late 1950's, tried in every way possible to aid and encourage prospectors and others in the search for commercial deposits of raw material for atomic energy in the State. No deposits have been discovered, but the State Geologist continues to keep in close touch with all studies and activities that may indicate the presence of likely raw materials.

C. Appraisal of specific benefits or failures from each study and activity listed in (A) and (B) above.

Considering the nature of the items listed in (A) and (B) above, we cannot say just what specific benefits have accrued or say just what may or may not be considered a failure. Some of the studies the Department participated in have not materialized, as of this date; but from a long range point of view, we never know just what the information learned today may have to do with new ideas and programs of the future. We do believe that we can say without reservation, however, that the information we have gained from participating in or contributing to studies of the past will leave us in a better position to encourage and promote industries and activities that have a direct relation to atomic energy.

D. Recommendations and proposals to expedite the actions and activities required or contemplated under the provisions of the Atomic Energy Act.

The active interest taken by the Governor of North Carolina in the Atomic Energy Act and the fact that he has requested that all pertinent information be made available to the Advisory Committee is a very heartening move. The field that has been opened up to us by atomic energy is so broad in scope that only by having an organization such as the Advisory Committee to receive and correlate all facts and information can we be sure that the State of North Carolina is moving swiftly and with thought into the atomic energy field.

As an example of what can be done, we need only look at the very fine program now being conducted at North Carolina State College and the subsequent benefits that will be derived from this program. On the negative side, we can look at the Blewett Falls project (Item A-2 above) which was abandoned after several years of study. The fact that this project was abandoned was in great measure due to the fact that our State has lagged in its effectiveness in planning a continuing program. AEC officials told representatives of the Department when looking into the reactor fuel (rods) facility that they felt that organization in planning in the over-all program had not taken place in the State.

In spite of the failures and known projects that have been abandoned, we still feel that North Carolina has by no means been standing still. The experimental work, especially in fibers and in our leading hospitals in isotope technology, are making substantial contributions to the whole science of atomic energy. In this vein of thought, we recommend a fuller utilization of all atomic energy technology with commodity application where indicated to private industry. As the necessity for secrecy, etc. are removed from the Commission's hands, it is sincerely hoped that these private ventures into civilian business, research, and manufacture may be magnified.

We would like to recommend also to the Commission that a current inventory be kept of North Carolina's planning and advancements in the whole atomic energy field. The State's industrial outlook is certainly in the direction of modern science activities and research. Direction on steps to accelerate and specific projects to undertake in this field is earnestly sought by the Department and by responsible leadership in North Carolina.

The final recommendation we would like to make is that the Advisory Committee, through a report such as this, bring about closer coordination between the many organizations and individuals who are interested directly or indirectly in the atomic energy field. This closer coordination will prevent duplicate studies from being undertaken and will insure that those groups or individuals who have mutual interest will pool their resources and their efforts in each venture undertaken.

JLA:rd

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North Carolina
BOARD OF CORRECTION AND TRAINING

March 13, 1962

Dr. William L. Wilson
Board of Health
Cooper Memorial Health Building
Raleigh, North Carolina

Subject: The Atomic Energy Act of 1959

Dear Dr. Wilson:

This follows our discussion of March 1, 1962, and complies with Governor Sanford's memorandum of February 28, 1962, to Heads of State Departments, Agencies and Institutions concerning the Atomic Energy Act of 1959.

Since the students in the Correction and Training Schools are juveniles, and at the same time educationally retarded, our Department has not been engaged in activities related to the implementation of this act. However, I am requesting Mr. J. Walter Bryan, Director of Education with the Board of Correction and Training, to serve as our liaison representative to the Atomic Energy Advisory Committee. May I assure you that our Department will be glad to cooperate in every way possible with the Committee and any time that we can be of service, please feel free to let us know.

With best wishes always,

(SIGNED)

Blaine M. Madison

BMM:lpm

cc: Honorable Terry Sanford
Mr. J. Walter Bryan

COPY

EAST CAROLINA COLLEGE

March 5, 1962

North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Gentlemen:

This is a report reflecting the activities of East Carolina College in aspects of atomic energy up to and including December 31, 1961.

The Extension Division of East Carolina College carries on an active program of training secondary school teachers and others (The others ranging from military personnel to highway patrolmen.) in radiation biology and health physics aspects of atomic energy. This is done through a course, Science 300 Ext., Radiological Biophysics, 4 qh credit. This course is supported from the standpoint of instrumentation and radioactive sources by instruments and a Cobalt 60 source on loan from the Civil Defense Agency of the State and Federal Government and the Atomic Energy Commission. Since January 1, 1961 approximately 50 people have participated and benefitted from this program alone. In addition to the college credit picture of the course in biophysics, over one hundred citizens completed a course in radiation monitoring in the fall of 1961 for no college credit. The college supplied personnel and physical facilities for the course as a public service to the immediate area served by the college. In addition to all this, the atomic energy resource of the college has directly served the local Naval Reserve and a branch of the Air Corps reserve.

East Carolina College now has an on campus course which has been approved that deals with the peaceful uses of atomic energy. This course is a senior graduate course in Biophysics. The course carries three quarter hours credit and will be taught as a part of the regular physics curriculum as an elective for physics majors and as an elective in other disciplines in the college curriculum, especially science. This course will be taught during the Spring of 1963.

The specific benefits accrued to date from the above program has been one of service to the citizens of the State in the context of the assigned mission of the college itself. In addition the public relations aspects of the program has been such as to generate confidence and good will in the immediate areas affected.

Two faculty members have attended institutes and seminars recently that dealt with peaceful uses of atomic energy. One faculty member took a formal course in radiation biology and the other a formal course in reactor physics.

March 5, 1962

It is proposed, by interested members of the science staff, that East Carolina College proceed immediately to get a sub critical reactor, to install a course in radio chemistry, radiation biology, and radiation physics. Attendant to this is the problem of one staff member to function as an electronics technician to keep instrumentation repaired. Inasmuch as this is such a high degree specialty the salary should be commensurate with that of an associate professor. Funds for these technicians should probably come from appropriations made for this purpose through an amendment to the Atomic Energy Act. This would permit the technicians to go from school to school, when and where needed.

To house an atomic energy installation at East Carolina College would require the modification of an existing garage at the back of Flanagan building.

The greatest current need at East Carolina College is that of proper instrumentation. There is enough existing courses and well implemented policies to justify considerable instrumentation - in the order of fifty thousand dollars to start. If an amount substantial enough were earmarked as available there is the possibility of getting matching funds from agencies of the Federal government, such as the National Institute of Health and the Atomic Energy Commission.

If we can be of further help please advise.

Very truly yours,

(SIGNED)

Frank W. Eller
Professor of Science
AEC License # 32-7668-1 (N63)
East Carolina College Liaison
Officer to the Committee

COPY

EMPLOYMENT SECURITY COMMISSION

OF

NORTH CAROLINA

March 19, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

In a letter from Governor Sanford dated February 28, 1962, we were asked to furnish you with information with respect to the activities of the Employment Security Agency in connection with the responsibilities described in the Atomic Energy Act of 1959.

In terms of the four types of responsibilities outlined by Governor Sanford's letter, we find that we have had no activity of the described character. This letter is to confirm this fact.

In addition, you asked that we designate one person on our staff to serve as our liaison to the Committee. Even though we do not anticipate any activities, we are designating Hugh M. Raper, Director of the Employment Security Research, to serve in this capacity in case you wish to discuss the Agency's responsibilities.

Sincerely,

(SIGNED)

Henry E. Kendall
Chairman



NORTH CAROLINA

STATE BOARD OF HEALTH

COPY

RALEIGH

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STATE HEALTH DIRECTOR
AND
SECRETARY-TREASURER

JACOB KOOMEN, JR., M. D., M.P.H.
ASSISTANT STATE HEALTH DIRECTOR

12 March 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is in reply to Governor Terry Sanford's memorandum of February 28, 1962 to Heads of State Departments, Agencies and Institutions, requesting a summary report reflecting State Board of Health activities up to December 31, 1961 under the Atomic Energy Act of 1959.

While I am an Ex Officio Member of the Atomic Energy Advisory Committee, Doctor W. L. Wilson of the State Board of Health Administrative Staff, and also a member of the Committee to 1967, is designated as the Boards' official liaison with the Committee.

Comments which follow, mere summary statements, are arranged by numerical references found in the Governor's memorandum. No explanation, or specific references to the Act, or reasons, are entered.

1. STAFF STUDIES UNDERTAKEN

Responsibilities of the State Board of Health were studied in detail in late 1959 to initiate compliance with the 1959 Act. This resulted in publication of a directive dated January 7, 1960 assigning all pertinent responsibilities by unit and/or by name of staff member.

Studies of potential needs of the other State agencies which should be appreciated and incorporated into a State Radiological Health Program were made early in 1960. This resulted in a letter, to 47 Heads of Departments, Agencies and Institutions concerned, which furnished a copy of the January 7, 1960 Board directive of organization; requested their advice as to (1) their own programs under the Act which would benefit by periodic reports to them of Board progress under the directive of January 7, 1960; (2) their activities for which they desired health planning and activities by the Board; (3) their recommendations which would lead to best coordination of the Board's program for radiological Health. Only 24 replies were received, mostly negative.

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Studies were made early in 1960 of means and measures required to handle adequately radiological accidents creating health hazards. This was coordinated thoroughly with the State Highway Patrol Headquarters. It resulted in a first procedural guide for the State Radiological Emergency Team, published 3 May 1960.

Activities which would and should be incorporated into a State Radiological Health Program were studied early in 1960. This resulted in publication of Chapter 15, Radiological Health, North Carolina State Public Health Plan, 23 May 1960.

Studies were made during May, 1960 of the "B" Budget needs to support the State Radiological Health Program. These later were approved by the State Board of Health and submitted to the Advisory Budget Commission and the General Assembly, but no funds were appropriated.

A study of the needs for graduate training in radiological health was made in May 1960. This produced a proposal by letter from the State Health Director to the Public Health Service. As a result a commitment was made by the Service to allot \$50,000 per year for five years to the University of North Carolina School of Public Health for graduate courses, begun in 1961 for 10 students.

Studies, assisted by Consultants, were made during August, 1960 of the State Radiological Health Program and the Program Plan. This resulted in publication 21 September 1960 of detailed listing of activities required, of personnel and physical means and resources required, including travel and training.

During August, 1960 a study was made of methods for coordinated law enforcement participation by sheriffs and local police, required in serious radiation accidents.

In October, 1960 a study was made of the needs of the Board's staff for training in radiological health. This resulted in coordinated approval for required training at increased rate, projected two years ahead.

Studies were made late in 1960 of the need for legislation related to radiological health essential to effective supporting of objectives listed in the 1959 Act. This resulted in recommendations for permissive legislation which would (1) provide necessary funds concurrently with satisfactory progress in program evaluation; (2) authorize State Board of Health licensing of North Carolina radiation sources; (3) State inspection and control responsibilities, over radioactive materials to be transferred from the United States Atomic Energy Commission (Public Law 86-373). No legislative approval occurred.

A study was made jointly with the State's Medical, Dental, Veterinary Medical, and Hospital Associations during April and May, 1961 to register all medical and health sources of radiation in the State. Association Presidents wrote all members and the Board mailed registration forms. This resulted in a total of 3892 voluntary registration of x-ray isotopes and radium sources, 2540 physicians, 1007 dentists, 191 veterinarians, and 154 hospitals.

C O P Y

Mr. Agnew H. Bahnson, Jr.

- 3 -

May 7, 1962

During May, 1961 a study was made of additional equipment required to meet future Board obligations. This resulted in allotment of diverted funds for procurement, primarily for laboratory equipment.

During May, 1961 a study was made of the effects of insufficient progress in development of the program. It resulted in a report to the State Board of Health and the Board's instruction to the State Health Director that he report the situation to the Governor. This was done by letter dated 18 May 1961.

During September, 1961 a study was made of the radiological effects predictable from Soviet atmospheric weapons testing and an estimate made of the public economic and psychological, and governmental public relations, effects likely to ensue. It resulted in (1) a letter to Governor Terry Sanford outlining a need for emergency allotment of funds not otherwise available to implement a sound minimal radiological health program; (2) a letter to the Director, Department of Administration, 12 December 1961, requesting the necessary action to allot the funds, (The funds were approved by the Council of State 29 January 1962).

During September, 1961 the State Radiological Emergency Team Handbook was published and distributed. It resulted in optimistic coordination of procedures and resources for State-wide response in event of a radiation accident.

During September, 1961 a study was begun to develop an organized training institute where persons needing greater capabilities in radiological health activities could be trained. A curriculum of four properly integrated courses was developed, two each at North Carolina State College and University of North Carolina School of Public Health. (The proposal now is drafted for the State Health Director, to the United States Atomic Energy Commission, which by telephone has resulted in AEC Commitment to sponsor the extension-course institute up to a total cost of \$39,000 for a first year beginning 1 June 1962).

In December, 1961 a study was made of the needs for a state acceptance of major responsibility previously carried only slightly by the United States Public Health Service, to evaluate health effects of atmospheric fall-out. This resulted in a letter to the Public Health Service Region III Director requesting funds and submitting detailed justifications therefor.

Since 1958 a continuing study has been made of (1) 31 key town water supply systems, covering all water basins - monthly; (2) 113 other towns - bimonthly; all supported by laboratory gross scan analyses.

2. ACTIVITIES TO ENCOURAGE AND INCREASE ATOMIC ENERGY SOURCES IN THE STATE

All radiological health capabilities which are suitable and effective comprise "any and all other acts deemed desirable in providing an effective protection program" (GS-104C; 1959, c. 481, p. 4). The State Board of Health has no other method, responsibility, or authority directly, to encourage and increase the State's atomic energy sources.

C O P Y

C O P Y

Mr. Agnew H. Bahnson, Jr.

- 4 -

May 7, 1962

3. SPECIFIC BENEFITS OR FAILURES RESULTING FROM STUDIES MADE, AND REPORTED HEREIN

Such cannot be appraised accurately at this time. Without past experience, which can be re-examined at a considerably later date, no opinion would be sound. Facts, reportable up to 31 December 1961, are

Fourteen staff members have completed 30 formalized training courses.

\$31,020 worth of equipment has been purchased and is on hand.

A coordinated State-wide system to handle accidents is "in-being", 24 hours every day."

A positive, sound State Radiological Health Program has been published and has progressed to maximum possible effectiveness.

4. PROPOSALS TO EXPEDITE DESIRABLE ACTIONS WHICH THE ACT MAINTAINS, ENVISIONS, OR REQUIRES THAT ARE PERTINENT TO THE STATE BOARD OF HEALTH:

I Enactment of permissive legislation which will

(1) Authorize licensing by the State Board of Health of all ionizing radiation sources in North Carolina.

(2) Promulgation and application by the State Board of Health of standards and guides recommended by the Federal Radiation Council rather than those of the United States Atomic Energy Commission.

II Appropriation of sufficient funds specifically for the purpose of implementation of the State Radiological Health Program compatible with the 1959 Act, as amended by I, immediately preceding.

III No other legislation which will impede, prevent or conflict with the 1959 Act, as amended by I and II, immediately preceding.

Sincerely yours,

s/ J. W. R. Norton

J. W. R. Norton, M. D.
State Health Director

C O P Y

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STATE OF NORTH CAROLINA

INSURANCE DEPARTMENT

March 6, 1962

Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Sir:

The activities of the Fire Service Division of the North Carolina Department of Insurance regarding radiation materials to date are as follows:

- (1) I met with representatives of the United States Office of Education, Trade and Industrial Education Branch, Washington, D. C., along with a host of other representatives of Fire Service Training people in March, 1960, for the purpose of reviewing a four hour and a twelve hour basic course entitled, "Peace Time Radiation Hazards in the Fire Service." This material has been completed and published in the following Manuals:

- (a) Basic Course - Resource Manual
- (b) Basic Course - Study Guide
- (c) Basic Course - Instructor's Guide

The material has been completed only a short period of time. Our interest in the subject of radio-active materials concerns the Fire Service involvement. This may be accidents by all modes of travel involving radio active materials and the storage of such materials in buildings throughout the State. Our interest in storage from the Fire Service standpoint has to do with fires in such buildings in which firemen must enter for rescue or fire fighting purposes.

Mr. David Lee, Fire Service Instructor with this Division, is at the present time preparing the twelve hour basic course entitled, "Peace Time Radiation Hazards in the Fire Service" to be taught in the Fire Departments of the State as time will permit.

Visual aids in the form of flip charts are available from the U. S. Department of Education to go along with this course. This is another area of concern to the Fire Service responsibilities that we are completely aware of but due to the staff limitations have not been able in the past to include this very important course into an already overcrowded curriculum.

The Fire Service is very much concerned with the Radiation problem which may result from accidents or storage since it is reasonable to assume that in event of any type of emergency incident involving this material, the firemen will probably be among the first to reach the scene and survey the situation.

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- 2 -

We are delighted to cooperate with your Committee in any way that we can regarding this very important subject as it relates to the Fire Service in North Carolina.

With kind personal regards, I am

Yours very truly,

(SIGNED)

Sherman Pickard, Director
Fire & Rescue Service Division

SP/jw

COPY

STATE OF NORTH CAROLINA

DEPARTMENT OF JUSTICE

2 March 1962

North Carolina Atomic Energy
Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Re: North Carolina Atomic Energy
Advisory Committee

Gentlemen:

With respect to the memorandum from the Governor on the above subject dated February 28, 1962, the Attorney General has designated the undersigned Assistant Attorney General Harry W. McGalliard to serve as liaison to the Committee.

This office's activity has consisted primarily of assisting in drafting legislation sponsored by your Committee or the State Board of Health in the field of atomic energy regulation.

Very truly yours,

T. W. BRUTON
Attorney General

(SIGNED) Harry W. McGalliard
Assistant Attorney General

HWMcG/js

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JUVENILE EVALUATION CENTER

March 21, 1962

Mr. Agnew H. Bahnson, Jr.
Chairman of the Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This will acknowledge receipt of the memorandum from Governor Terry Sanford dated February 28, 1962 regarding activities related to the Atomic Energy Act of 1959.

The Juvenile Evaluation Center in Swannanoa is a clinical setting for the treatment of delinquent children who have emotional problems. We have carried on no activities related to atomic energy and have no future plans in this area.

In compliance with the request of the memorandum I have designated Mr. J. L. Parrish, Assistant Director of the Juvenile Evaluation Center, as a liaison to your committee.

If further information is needed or we can be of any assistance please let us know.

Sincerely,

(SIGNED)

R. Vance Robertson
Director

RVR:nsr

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NORTH CAROLINA

STATE BUREAU OF INVESTIGATION

Department of Justice

March 7, 1962

Mr. Agnew Bahnson, Jr., Chairman
Atomic Energy Advisory Committee
Post Office Box 2091
Raleigh, North Carolina

Dear Chairman Bahnson:

The State Bureau of Investigation is now making use of atomic energy in a limited way through the cooperation of Mr. E. Jack Story, Director of North Carolina State College Reactor Project. Our Chemical Section in the Crime Laboratory of the SBI last year asked Mr. Story to assist us in running some tests in homicide cases, motor vehicle crimes and frauds.

Through studies which have been initiated we believe neutron activation analyses may be applied to the solution of certain problems involved in illicit drug traffic here in North Carolina. We also feel that other types of analyses can be successfully made when personnel and budget are available for further exploration in the field of atomic energy. Specifically, our Chemical Laboratory is interested in neutron activation analyses that can be applied to forensic chemistry. This could be of great benefit to the further advancement of law enforcement scientifically and for the people of our State.

Your assistance in helping us further the advance in this field of service will be appreciated.

Sincerely yours,

(SIGNED)

Walter F. Anderson
Director

WFA:w

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STATE OF NORTH CAROLINA
THE NORTH CAROLINA MEDICAL CARE COMMISSION

March 20, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

Pursuant to Governor Sanford's memorandum of February 28 requesting information from State departments that would be beneficial to the Atomic Energy Advisory Committee, I am providing the following relating to the activities of the Medical Care Commission:

1. The Medical Care Commission is responsible for the allocation of Federal, State and local funds in the construction of hospitals and related medical facilities under the so-called Hill-Burton Act. It is also responsible for the licensure of hospitals.
2. In both the construction and licensing programs, the Commission requires that X-ray producing equipment and areas where it is installed and facilities for radioisotopes, including teletherapy apparatus utilizing Radium, Cobalt-60 or Cesium-137 comply with applicable handbooks of the National Bureau of Standards, the Atomic Energy Commission and other codes.
3. We are furnishing Dr. W. L. Wilson of the State Board of Health a Complete List of North Carolina Hospitals (Non-Federal) indicating those that are licensed and which, according to our records, provide therapeutic X-ray facilities and radioisotopes. It is to be assumed that all listed hospitals routinely provide diagnostic X-ray. We are asking Dr. Wilson to inform us of any discrepancies according to his records.
4. In administering the licensing program, as well as in inaugurating construction projects where diagnostic or therapeutic radioactive facilities are involved, we would be pleased to work out a cooperative arrangement with Dr. Wilson's department in reviewing specifications for such installations. We are now inviting hospitals to solicit the services of Dr. Wilson's department in checking out questionable existing installations.

COPY

Mr. Agnew H. Bahnson, Jr.

- 2 -

March 20, 1962

5. At the present time, it is our understanding that regulations of the Atomic Energy Commission apply to the disposal of radioactive wastes in public and privately owned hospitals. It is anticipated that this responsibility may be transferred to the State upon acceptance by the Federal Government of a State-sponsored inspection program. The Medical Care Commission would be pleased to cooperate when this arrangement is finalized.
6. While the Commission's primary responsibilities are in the construction of hospitals and maintenance of operating standards, we at the same time are interested in the availability of qualified professional personnel to staff hospitals subject to our licensing authority. Accordingly, the Commission would be pleased to cooperate with the Atomic Energy Advisory Committee in increasing the availability of competent technicians in X-Ray and radioisotopes departments of local general hospitals and other diagnostic facilities.
7. Taking into consideration the Commission's responsibilities under Article 13 of G. S. 131, the Commission is anxious to cooperate in inaugurating the provisions of the Atomic Energy Act of 1959 and its possible future amendments.

In accordance with the Governor's request, I am designated as the representative of the Medical Care Commission to serve as liaison to the Atomic Energy Advisory Committee.

I hope that you or Dr. Wilson will not hesitate to advise me if there is supplementary information the Medical Care Commission can provide that would be beneficial to the Atomic Energy Advisory Committee.

Yours very truly,

(SIGNED)

William F. Henderson

WFH:eco

Enclosure: List of hospitals

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STATE OF NORTH CAROLINA

STATE HIGHWAY PATROL

14 March 1962

MEMORANDUM TO:

Mr. Joe W. Garrett
Assistant Commissioner
Department of Motor Vehicles

Reference is made to your memorandum of 6 March 1962 and to the attached memorandum from Governor Terry Sanford dated 28 February 1962. Please be advised that the North Carolina State Highway Patrol has not directly engaged in activities designed to increase the beneficial use of atomic energy in North Carolina; however, in light of the fact that there has been an increase in the transportation of radioactive material by air, railway and freight lines in and through North Carolina, we have taken steps to assure safety in transportation and to decrease the danger of death or injury in case of accidental discharge of nuclear devices or materials. We have taken the steps listed below to cope with this increasing problem.

1. More than three years ago we drew up General Order No. 124 entitled Procedures Applicable To Accidents Involving Radioactive Materials and/or Nuclear Devices. We distributed this General Order to all members of the State Highway Patrol and we have discussed it thoroughly for all members in In-Service Training Schools.

2. We have provided several hundred copies of this General Order to the State Board of Health for distribution to 318 Police Agencies, to 100 Sheriff's Departments and to other responsible officials.

3. We have trained three members of our organization in radiological monitoring and they have been licensed to handle Cobalt 60 (a radioactive material).

4. Currently Dr. W. L. Wilson and Mr. J. C. Lumsden, Engineer, both of the State Board of Health, are delivering two-hour lectures and demonstrations to commissioned and noncommissioned officers on the subject of Nuclear Hazards and Radiological Monitoring. We expect to continue this two-hour program in all the In-Service Schools for 1962 and to utilize the services of one of our Patrolmen who is versatile and adequately trained in this area.

5. The Administrative Headquarters has participated with Civil Defense authorities in three exercises practicing defense against the detonation of nuclear weapons. The following members of Administrative Headquarters have participated in this activity: Colonel David T. Lambert, Major W. Blake Lentz and Lieutenant E. W. Jones.

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Mr. Joe W. Garrett

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14 March 1962

6. The Highway Patrol has set up a transportation system for members of the Radiological Emergency Team, which is set forth in General Order No. 124, and we have practiced a trial emergency transportation to Mocksville, North Carolina.

7. Colonel David T. Lambert attended a Civil Defense Workshop as a part of the I.A.C.P. Convention in Montreal, Canada, and lectured to the group on Police Services in National Emergencies. He has also attended and participated in a Seminar for Region Three in Miami, Florida. This seminar was composed of police officials from seven states and the matter of Police Services in National Emergencies was discussed thoroughly by the different groups. The objective of the seminar was to establish up-dated policies and procedures to be used in event of a national emergency.

(SIGNED) David T. Lambert, Colonel
Commanding
State Highway Patrol

EWJ:jfb

Attachments:

General Order No. 124
Copy of Speech delivered at Montreal, Canada

COPY

STATE OF NORTH CAROLINA

Personnel Department

March 7, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is in reference to Governor Terry Sanford's memorandum of February 28, 1962, relating to the Atomic Energy Act of 1959.

I am not in a position to make any specific recommendations or proposals inasmuch as the duties and responsibilities of the State Personnel Department does not extend into this field. I, as State Personnel Director, will be the liaison officer for this Department for whatever assistance I may be able to render.

Sincerely,

(SIGNED)

Edwin S. Lanier

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STATE OF NORTH CAROLINA

PRISON DEPARTMENT

March 13, 1962

Dr. W. L. Wilson, Secretary
North Carolina Atomic Energy
Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Re: The Governor's Memorandum dated
28 February, 1962

Dear Sir:

In compliance with the provisions of Governor Sanford's memorandum
I wish to report that there has been no activity by the Prison Department
up to 31 December, 1961, under the Atomic Energy Act of 1959.

Sincerely,

(SIGNED)

Martin R. Peterson
Assistant Director of Prisons

MRP:lmf

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STATE OF NORTH CAROLINA

Department of State

March 2, 1962

Dr. W. L. Wilson, Secretary
North Carolina Atomic Energy
Advisory Committee
Post Office Box 2091
Raleigh, North Carolina

Dear Dr. Wilson:

Mr. Eure has given me the memorandum from the Governor dated February 28th, relative to the North Carolina Atomic Energy Advisory Committee.

As far as I have been able to determine, no action has been taken or reports compiled in this office concerning the functions of your committee. However, Mr. Eure has designated me as the one to serve as liaison officer between the Department of State and the Atomic Energy Advisory Committee, which I am happy to accept, and this is to assure you that I shall co-operate with you and your agency in any capacity of which I am capable.

With best wishes, I am

Yours very truly,

(SIGNED)

E. S. Eskridge
Deputy Secretary of State

ESE/nek

COPY

NORTH CAROLINA STATE COLLEGE

27 March 1962

Mr. Agnew H. Bahnson, Jr.
Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is in reply to the memorandum from Governor Sanford on February 28th, requesting a brief report reflecting the activities of North Carolina State College in the field of atomic energy.

As in the past, North Carolina State College continues its leadership in nuclear engineering education, as well as research utilizing the nuclear reactors and the equipment received through grants from the Atomic Energy Commission. These grants total something over \$200,000.

There are now several research contracts in force with the Atomic Energy Commission. One of these is in the area of neutron diffraction, where materials are being studied through use of this technique. Another is on the diffusion of neutrons in various liquids, including heavy water. Work continues in the irradiation of textile fibers and the effect of radiation on living organisms.

The use of radioisotopes in the research programs on the campus is quite extensive. There are approximately 250 active projects using these isotopes. The staff has encouraged the use of atomic energy and radioisotopes through numerous talks given to civic groups throughout the State. They have also participated in the visiting lecture programs in this area sponsored by various government agencies.

Three members of the North Carolina State College staff are serving on the Atomic Energy Committee; these are Dean H. Brooks James, Dean A. C. Menius, Jr., and Mr. E. J. Story.

I hope that this information is sufficient to cover the four items listed in the Governor's memorandum.

Very sincerely,

(SIGNED)

John T. Caldwell

COPY

STATE OF NORTH CAROLINA
DEPARTMENT OF TAX RESEARCH

March 19, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
N. C. Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

This is written in compliance with the memorandum of February 28, 1962, from Governor Sanford requesting a report up to December 31, 1961, of activities relating to atomic energy.

This department has conducted no studies nor has it conducted any activities in connection with the development of atomic energy in North Carolina.

We are currently examining the various areas in which we are equipped to operate in the hope that we will be able to contribute to the purpose for which the Atomic Energy Act was enacted. For example, we plan to examine the budgets of the various states in an effort to ascertain the amounts expended in activities related to atomic energy and to examine the tax laws of other states to see if there is any specific legislation providing incentives to industries or organizations engaged in atomic energy uses or research.

Mr. Eugene Dail, Assistant Director, will serve as liaison to the Atomic Energy Advisory Committee.

If you have any suggestions as to ways in which our staff could serve, we will be happy to hear from you.

Sincerely yours,

(SIGNED)

H. C. Stansbury
Director

HCS/ctj

COPY

STATE OF NORTH CAROLINA

TAX REVIEW BOARD

March 5, 1962

Dr. W. L. Wilson, Secretary
Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Re: N. C. Tax Review Board

Dear Dr. Wilson:

In accordance with the Governor's memorandum of February 28, 1962, I am writing you in regard to the activities of the Tax Review Board concerning the Atomic Energy Act of 1959.

As there have been no activities of the Tax Review Board relating to atomic energy, I am unable to give the report requested. In this respect, it is requested that the Tax Review Board be reported as having had no activities on atomic energy but that any future activities will be reported in the manner requested.

For the purpose stated, you may contact the undersigned on matters between the Committee and the Tax Review Board.

Sincerely yours,

(SIGNED)

Harlan E. Boyles
Executive Secretary

HEB:mew

cc: Governor's Office

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STATE OF NORTH CAROLINA
DEPARTMENT OF THE TREASURER

March 5, 1962

Dr. W. L. Wilson, Secretary
Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Re: Department of the State Treasurer

Dear Dr. Wilson:

In accordance with the Governor's memorandum of February 28, 1962, I am writing you in regard to the activities of the Department of the State Treasurer concerning the Atomic Energy Act of 1959.

As there have been no activities of the Department of the State Treasurer relating to atomic energy, I am unable to give the report requested. In this respect, it is requested that the Department of the State Treasurer be reported as having had no activities on atomic energy but that any future activities will be reported in the manner requested.

For the purpose stated, you may contact the undersigned on matters between the Committee and the Department of the State Treasurer.

Sincerely yours,

(SIGNED)

Harlan E. Boyles
Deputy State Treasurer

HEB:mew

cc: Governor's Office

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REPORT OF THE UNIVERSITY OF NORTH CAROLINA
AT CHAPEL HILL
TO THE ATOMIC ENERGY ADVISORY COMMITTEE

March 1962

Activities at the University of North Carolina that have implications leading to increased uses of atomic energy are best described in three categories: Training, basic experimental and theoretical research, and applications along medicinal lines in the School of Medicine.

In order to encourage experimentation and training in the uses of high energy radiation and to oversee properly the handling of radio-active materials, the University has engaged a radiation safety officer, Mr. Raymond C. Pflieger, who is responsible for the various aspects of radiological health of the University. Mr. Pflieger is responsible to two committees at the University, the Radioisotopes Committee and its Subcommittee on Human Applications of Radioisotopes.

Below are outlined our activities in these three principal areas of effort:

Training. Through the Assistance of the Atomic Energy Commission, equipment grants have been secured by the Departments of Botany, Pathology, Chemistry, Geology and Radiology for training laboratories in the uses and handling of radioactivity. Currently, the Physics Department has a similar application before the Atomic Energy Commission. These departments and others are training individuals in their fields of speciality in the theory, use, and handling of radioactivity.

One training program of special interest is conducted in the School of Public Health under the directorship of Dr. Emil Chanlett. This program, under the sponsorship of Public Health Service, began in February, 1961, and provides for the advanced training of radiation health specialists. It has been approved for five years at a level of approximately \$50,000 per year and is jointly conducted on the Chapel Hill campus and the campus at State College where Dr. Newton Underwood is a co-director. The training of specialists in radiological health will contribute greatly to future possibilities of the application of atomic energy in the State of North Carolina, for as nuclear installations for industrial or research purposes develop, the need for such individuals will be acute.

Research. With 38 laboratories equipped to use radio-active materials on the campus at Chapel Hill, there are many research projects that involve the use of radioisotopes for one purpose or another. Many of these programs involve the use of radioisotopes as tracers, where the isotopes are simply tools in research directed toward other aims.

However, a sampling of some of the projects where radiation and properties of isotopes, etc., are of prime interest follows:

In the Department of Physics, Professor Shearin is operating a two mev Van de Graaf accelerator in studies of radiation damage in metals and Coulomb excitation.

Dr. L. M. Slifkin is studying intermetallic diffusion by use of radioisotopes.

Dr. Eugen Merzbacher, in the Department of Physics, is conducting theoretical studies of nuclear energy levels.

In the Department of Zoology, Dr. Maurice Whittinghill is studying the effects of radiation on genetic mutations.

In the Department of Chemistry, Dr. Henry C. Thomas is using radioisotopes in a study of the adsorption of ions on clay minerals. This work will have implications concerning the disposal of products and radiation wastes.

Most of the research studies on this campus are not conducted toward immediate uses, but rather are of a fundamental nature that will in time contribute through an expanded base of knowledge to the increased use of high energy radiation and radioisotopes.

Medical Applications. The Department of Radiology in the School of Medicine is receiving an average of 25 monthly shipments of radioisotopes for distribution to individual authorized users. The human use of radioisotopes for diagnostic, therapeutic and research purposes is constantly increasing and is now facilitated by the approval of a broad license to the Subcommittee on Human Applications of Radioisotopes in December of 1961. This enables authorization for human uses to be obtained locally instead of being referred to the Atomic Energy Commission headquarters for approval.

Attached to this report is the 1961 report of the Radioisotopes Committee to the University of North Carolina Faculty Council. This report of the Radioisotopes Committee is a somewhat detailed account of the handling procedures for radioisotopes at the University.

University of North Carolina

1961

One hundred and sixty-two persons in thirty-eight laboratories within the University of North Carolina at Chapel Hill are actively engaged in work requiring the use of radioactive materials. This very considerable effort is by Federal law to be prosecuted only under license of the United States Atomic Energy Commission. This University carries on its work with "by-product radioactive materials" under the terms of License No. 32-573-2(L63) and its six amendments. The terms of this license give the workers in the University very considerable freedom, subject, however, to the over-riding condition specified in Amendment No. 6 (February 13, 1962) which reads as follows:

"Condition 13 is amended to read:

13. Licensed material for Research and Development as defined in Section 30.4(k) of Title 10, Code of Federal Regulations, Part 30, Chapter 1, "Licensing of Byproduct Material," shall be used by, or under the supervision of, individuals approved by the Radioisotope Committee of the University of North Carolina, Dr. Henry C. Thomas, Chairman. Byproduct material for human use shall be used by, or under the supervision of, individuals approved by the Subcommittee on Human Applications of Radioisotopes, Dr. C. D. Van Cleave, Chairman. The use of byproduct material in humans shall be by, or under the supervision of, a physician.

The final responsibility for the proper use of radioactive materials thus rests with these two committees. To make possible the proper oversight of the work with radioactive materials, the University supports an Office of Radiological Safety. The Radiation Safety Officer, Mr. Raymond C. Pfleger, maintains this Office and is responsible to both of these committees for the various aspects of the radiological health of the University.

The University Radioisotope Committee is directly responsible for all uses of radioactive materials not involving human application. Its principal duty is to interview all new users of radioisotopes and to assure itself that the proposed application will not expose personnel to undue hazard and that proper provision is made for the care and disposal of radioactive wastes. When such use is approved by the committee, it then becomes the responsibility of Mr. Pfleger's Office to see to it that the provisions of our license are fulfilled.

A detailed account of the activities of the Radiation Health Officer is to be found in his series of reports to Mr. J. Arthur Branch, Business Manager. Mr. Pfleger makes routine surveys of the various laboratories and reports the conditions found to those directly responsible. When necessary he calls attention to required decontamination and makes follow-up surveys to see that the work is properly done. The Office of Radiological Safety carried out the calibrations of the survey meters, which are continually used to ensure that the radiation levels are kept within the low tolerances demanded. This Office also handles directly the disposal of radioactive wastes. All purchases of radioactive material are made only by permission of the Safety Office. This Office is also responsible for the film badge service by means of which a complete record is kept of the exposure to radiation of the personnel involved. By these various means the very voluminous and detailed records demanded by the Atomic Energy Commission are kept in order.

The human use of radioisotopes for diagnostic, therapeutic, and research purposes was facilitated by the approval of a broad use license to the Subcommittee on Human Application of Radioisotopes in December, 1961. All authorizations for the human use of radioisotopes in the Division of Health Affairs can now be obtained locally, instead of being referred to AEC headquarters for approval. To meet the added responsibilities the Subcommittee has set up criteria of training and experience for proposed clinical users as well as the supervisory conditions under which primary responsibility for the administration of radioisotopes to patients can be delegated to approved fellows and residents. The average monthly number of shipments of radioisotopes received at the Department of Radiology for distribution to individual authorized users was about 25 in 1961.

The Atomic Energy Commission periodically submits the University to a rigorous inspection to see that it complies with the law. We at present feel that we are in very good condition as regards our radiological precautions. These are not such as to be onerous and to interfere with scientific work, but they are such that as a result of an inspection carried out by an officer of the Atomic Energy Commission during four days of the week of July 17, 1961, only very minor cases of non-compliance with regulations were found. This inspector gave of us an excellent report to the Atomic Energy Commission.

The writer is indebted to Dr. C. D. Van Cleave for the statement regarding the human use of radioisotopes.

Respectfully submitted,

THE UNIVERSITY RADIOSIOTOPE COMMITTEE

J. A. Branch
H. D. Crockford
R. L. Ingram
D. A. Okun

L. M. Slifkin
Henry C. Thomas, Chairman
J. E. Wilson
E. A. Wood

COPY

NORTH CAROLINA UTILITIES COMMISSION
REPORT ON ACTIVITIES WITH NUCLEAR ENERGY PROJECTS

The activities of the North Carolina Utilities Commission relating to the peacetime uses of nuclear energy under the Atomic Energy Act of 1959 fall into two categories, active participation in the work of the Committee on Nuclear Energy in the Electric Industry of the National Association of Railroad and Utilities Commissioners, and cooperation with the Carolinas Virginia Nuclear Power Associates who are constructing a prototype nuclear generating plant located at Parr, South Carolina for research and experimental purposes.

The Chairman of the Commission has been a member of the NARUC Committee on Nuclear Energy in both 1960 and 1961. This committee makes, on a continuing basis, studies on a national scale with regard to the feasibility and practicability of producing electrical energy from nuclear sources as well as the regulatory treatment of investments by privately owned utilities in plants constructed for research and development in this field. A copy of the 1961 report of this committee is attached.

The Carolinas Virginia Nuclear Power Associates is a non-profit, non-stock corporation organized under the laws of the State of North Carolina for the purpose of conducting research and development in the field of nuclear energy for the generation of electricity. The CVNPA was organized by Duke Power Company, Carolina Power & Light Company, Virginia Electric and Power Company and South Carolina Electric and Gas Company. The first three companies named operate under the jurisdiction of the North Carolina Utilities Commission; the last named company operates only in South Carolina.

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- 2 -

This Commission in 1958 authorized the construction, by CVNPA, of a 19,000 kilowatt nuclear generating plant to be located at Parr, South Carolina at which location a suitable turbine generator was already installed in a plant of South Carolina Electric and Gas Company. The nuclear energy plant to be constructed will utilize the present generating facilities of this plant which is a coal-fired operation. This plant was selected, among other reasons, due to the fact that the steam pressure and superheat characteristics of the generating equipment were suitable for the steam output of the reactor.

The total cost of this plant is estimated to be approximately \$43,000,000 of which approximately \$13,000,000 will be provided by the Atomic Energy Commission. The remainder is to be contributed by the member companies in amounts proportionate to their respective system capacities. This Commission has authorized the companies under its jurisdiction, participating in the project, to charge to Account 801-Miscellaneous General Expenses, over a period of ten to twelve years, their contributions to this project for research and experimental work on nuclear energy. It is now scheduled to go into operation in late summer of 1962.

COPY

NORTH CAROLINA
VETERANS COMMISSION

March 6, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
N. C. Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

In response to Governor Sanford's memorandum of February 28, 1962 we submit in triplicate the North Carolina Veterans Commission's report on any activities up to December 31, 1961 pursuant to the N. C. Atomic Energy Act of 1959. As a preface to our specific, numbered statements as requested in the memorandum, let me say that the requirements of the 1959 Act do not appear germane to the purposes or activities of the Veterans Commission. Further, the very small staff of this agency would preclude any practical participation in programs outside our present areas of major responsibility.

The following numbered statements, with our comments or replies, correspond to those enumerated in the memorandum:

1. Studies your staff have undertaken to increase maximum beneficial uses of atomic energy in North Carolina. NONE
2. Their activities to encourage and increase atomic energy sources in the State. NONE
3. Your appraisal of the specific benefits or failures from each study and activity listed. NONE
4. Your recommendations and proposals designed to help expedite any and all desirable actions the Act mentions, envisions, or requires. NONE

Due to our limited personnel, I designate myself to serve as this agency's liaison to the Committee on all matters charged to that Committee.

Sincerely yours,

(SIGNED)

Collin McKinne
Director

CMcK:mf

COPY

STATE OF NORTH CAROLINA
DEPARTMENT OF WATER RESOURCES

May 4, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory
Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

Reference is made to the Governor's memorandum of February 28, 1962, regarding the activities by state agencies under the North Carolina Atomic Energy Act of 1959.

The contents of this letter are not entirely responsive to the questions asked in the Governor's memorandum, but after a conference with Dr. W. L. Wilson, it was decided that you might be interested in the activities of this Department with regard to radioactivity.

The activities of the Department with regard to radioactivity are conducted by the Division of Stream Sanitation and Hydrology and consist of a limited program under which samples of stream water are collected and analyzed for total radioactivity from twenty-five (25) sampling points throughout the State. The sampling stations have been selected on interstate streams at or near the State line and near the mouths of intrastate streams so as to accumulate data reflecting the level of radioactivity at such points.

This program complements a similar program being conducted by the State Board of Health under which samples for radioactivity are being collected from streams serving as sources of public water supply. Both are essential and should be continued and expanded to provide background data upon which any increases in the level of activity may be observed and evaluated.

The Division of Stream Sanitation and Hydrology is, accordingly, planning to expand its sampling program in an effort to provide adequate coverage of the surface waters to permit the detection of any increase in radioactivity which might adversely affect their usage for fish and wildlife, agriculture, industry, and recreation. Samples will be analyzed for background activity and the results will be compiled and made available to all agencies and others having an interest in the problem.

Please let me know if you desire any additional information regarding this Department's activities.

Sincerely yours,

(SIGNED) Harry E. Brown

Enclosures

COPY

NORTH CAROLINA
STATE BOARD OF PUBLIC WELFARE

March 2, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
Post Office Box 2091
Raleigh, North Carolina

Dear Mr. Bahnson:

We have received the memorandum from Governor Sanford, dated February 28, 1962 with regard to the Atomic Energy Act of 1959. To our knowledge this Act does not apply in any respect to the responsibilities of the State Board of Public Welfare. If at any time planning for people becomes involved in such a way with the work of your Committee that you feel public welfare has a responsibility, we shall appreciate your getting in touch with us.

Sincerely,

(SIGNED) Ellen Winston
Commissioner

EW/a

CC - Governor Sanford

COPY

STATE OF NORTH CAROLINA
WILDLIFE RESOURCES COMMISSION

March 8, 1962

Mr. Agnew A. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Sir:

In regard to Governor Sanford's memorandum dated February 28, 1962, it is hereby reported that the Wildlife Resources Commission, by the nature of its duties and responsibilities, has not engaged in any activities relating to atomic energy.

Although no such activities are anticipated in the near future, I have requested Mr. Eugene E. Schwall, Assistant Director, to serve in a liaison capacity with your Committee.

Cordially and sincerely,

(SIGNED) Clyde P. Patton

CPP/jgp

COPY

THE WOMAN'S COLLEGE
OF
THE UNIVERSITY OF NORTH CAROLINA

March 12, 1962

Chairman
North Carolina Atomic Energy
Advisory Committee
P. O. Box 2091
Raleigh, North Carolina

Dear Sir:

This is in reply to the memorandum from Governor Terry
Sanford on February 28.

We anticipate in the future that we will have research under
way in nutrition and in biology which will involve atomic
energy. At present we have none.

Sincerely,

(SIGNED)

Otis A. Singletary
Chancellor

OAS:nw

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE LIAISONS

DEPARTMENTS, AGENCIES, INSTITUTIONS

Administration, Department of
Mr. Hugh Cannon, Director
Raleigh, North Carolina

Agricultural and Technical College
Dr. Gerald Edwards, Chairman
Department of Chemistry
Greensboro, North Carolina

Agriculture, Department of
Mr. L. Y. Ballentine, Commissioner
Raleigh, North Carolina

Appalachian State Teachers College
Professor W. H. Plemmons
Office of the President
Boone, North Carolina

Archives and History, Department of
Mr. Christopher Crittenden, Director
Raleigh, North Carolina

Broughton Hospital
John S. McKee, Jr., M. D.
Superintendent
Morganton, North Carolina

Civil Defense Agency
General Edward F. Griffin, Director
Raleigh, North Carolina

Conservation and Development, Department of
Mr. Marshall L. Shepherd
Industrial Development Representative
Raleigh, North Carolina

Correction and Training, Board of
Mr. J. Walter Bryan, Director of
Education with the Board of Correction and Training
Raleigh, North Carolina

East Carolina College
Frank W. Eller
Professor of Science
Greenville, North Carolina

Employment Security Commission
Mr. Hugh M. Raper, Director of
the Employment Security Research
Raleigh, North Carolina

Health, State Board of
William L. Wilson, M. D.
Administrative Staff
Raleigh, North Carolina

Insurance, Department of
Mr. Sherman Pickard, Director of
Fire Service Training
Raleigh, North Carolina

Investigation, Bureau of
Mr. Walter F. Anderson, Director
Department of Justice
Raleigh, North Carolina

Justice, Department of
Harry W. McGalliard
Assistant Attorney General
Raleigh, North Carolina

Juvenile Evaluation Center
Mr. J. L. Parrish
Assistant Director of the
Juvenile Evaluation Center
Raleigh, North Carolina

Medical Care Commission
Mr. William F. Henderson
Executive Secretary
North Carolina Medical Care Commission
Raleigh, North Carolina

Motor Vehicles, Department of (State Highway Patrol)
Joe W. Garrett
Assistant Commissioner
Raleigh, North Carolina

Personnel, Department of
Mr. Edwin S. Lanier
Director
Raleigh, North Carolina

Prison, Department of
Mr. Martin R. Peterson
Assistant Director
Raleigh, North Carolina

Recreation Commission
Mr. J. D. Foust
Assistant Director
Raleigh, North Carolina

State, Department of
E. S. Eskridge
Deputy Secretary of State
Raleigh, North Carolina

North Carolina State College
John T. Caldwell
Chancellor
Raleigh, North Carolina

Tax Research, Department of
Mr. Eugene Dail, Assistant Director
Raleigh, North Carolina

Tax Review, Board of
Mr. Harlan E. Boyles
Executive Secretary
Raleigh, North Carolina

Treasurer, Department of
Mr. Harlan E. Boyles
Deputy State Treasurer
Raleigh, North Carolina

University of North Carolina
Dr. Henry C. Thomas
Department of Chemistry
Chapel Hill, North Carolina

Utilities Commission
L. M. Kever
Electrical Engineer
Raleigh, North Carolina

Veterans Commission
Mr. Collin McKinne, Director
Raleigh, North Carolina

Water Resources, Department of
Mr. Harry E. Brown, Director
P. O. Box 9392
Raleigh, North Carolina

Welfare, Board of Public
Ellen Winston, Commissioner
Raleigh, North Carolina

Wildlife Resources Commission
Mr. Eugene E. Schwall
Assistant Director
Raleigh, North Carolina

Woman's College of The University of North Carolina
Otis A. Singletary, Chancellor
Greensboro, North Carolina

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

Report of the
Subcommittee on Agriculture
February 8, 1962

Producers of food and fiber have a major interest in all developments relating to peaceful uses of atomic energy. They are equally concerned with the proper preparation of the producer and processor as well as the consumers for a possible emergency. This would indicate the following areas of primary concern to the Subcommittee on Agriculture for consideration and action:

1. A more complete understanding of the direct effects of radiation on plant and animal materials. At present, this would be directed as an area of research or as a tool for research. The production of genetic changes in germ plasm, modification of sexual behavior, sterilization of foods, and localized disease control are problems that presently are becoming more completely understood.
2. The "food chain", or the relationships between soil, plant, water sources, and atmosphere in the production of food, must be more completely understood. The effects of fallout on soils and the subsequent uptake by plants may thus be properly evaluated and developed into directions for food producers and consumers in an emergency.
3. As research attempts to answer the questions associated with the effects of radiation on plant, animal, and other materials, the disposal of atomic wastes becomes a problem of concern. A more adequate understanding of problems associated with procedures and practices of waste disposal is needed.
4. The layman must be more adequately informed. The educational process should be available at all levels of the total educational system. The program on Civil Defense would become more effective with more complete understanding of the types of radiation and the nature of fallout materials. Students should become aware of the peaceful uses of radiation and irradiation, starting in elementary schools and continuing through secondary schools and undergraduate work in college.

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

Report of the
Subcommittee on Agriculture
June 21, 1962

Nuclear Energy Activities Relating to Agriculture in North Carolina

The use of nuclear energy in agricultural research in North Carolina was initiated in 1949 when an attempt was made to determine the effects of ionizing radiation on the genetic constitution of the peanut. This adventure is one of the success stories in agricultural research in this state.

The use of nuclear energy in the agricultural research program has continued with a gradually increasing tempo for the past thirteen years. The greater portion of this work has been through the use of various radioisotopes as laboratory tracer tools in the study of mineral metabolism of both plants and animals. Studies have also involved the use of ionizing radiation to affect genetic, reproductive or physiological behavior in biological materials. Labeled radioisotopes were first used in the North Carolina Agricultural Experiment Station in 1951. During that year four studies were initiated using various labeled minerals in metabolism studies. Since then, 92 projects have been activated. In 1961 alone, ten programs were started involving inorganic as well as organic labeled compounds. The number of projects initiated does not truly indicate the volume of research being conducted using this particular tool. A list of projects involving the use of radioisotopes, by year of initiation, is appended. This list does not accurately reflect the total use of nuclear energy in agricultural research since many biological radiation studies have been initiated at State College, at Brookhaven, at Oak Ridge, and at the Savannah Laboratories.

The use of nuclear energy in agricultural research may be divided into four general categories. These categories follow logical sequence in the development of this research. In the beginning, radioactive or marked materials were used as tracers for a specific mineral in metabolism studies of plants and animals. A second area of study included the effects of radiation on all biological materials.

At first, major concern in this area dealt with the survival of biological materials and the nature and magnitude of the genetic changes that were induced in plant and animal populations through its use. Later studies were more concerned with effects on reproduction and physiology. The third general category is the consequence of the normal development of the first. One or more organic elements used as tracers or markers have been incorporated into organic compounds; thus, the organic compounds so marked have made available a new tool for the study of intermediary metabolism. This isotope tool allows the biochemist, whether he be interested in plant, animal or human physiology, to more completely understand the functions of the marked organic compounds in the total metabolic processes of the biological material, and thus to learn of the role and ultimate fate of the organic constituents of plant and animal life. The fourth development involves the use of ionizing radiation in the processing, packaging and preservation of human foods. Undoubtedly, the military services have made heavy investments in this area, but the products of their efforts are not in evidence to the consuming public.

A major opportunity for the economic expansion of nuclear energy activity related to agriculture is to be expected in the fields of food processing and preservation. Much work must be done at the more basic research levels, particularly in those areas involving an understanding of the metabolic and enzymatic changes during processing and preservation of both plant and animal materials, before the challenges of this opportunity are available. Such research can only be truly fruitful through a cooperative coordinated research team involving personnel trained in the basic disciplines of both biological and physical sciences. Our greatest concern is the availability of scientific manpower with the training, ability, ideas, and enthusiasm to make research progress in these areas. Present facilities available to agricultural research scientists at North Carolina State College are being used at their maximum capacity.

List of Research Projects Involving the Use of Radioisotopes
in the
Agricultural Research Program at North Carolina State College
From 1951 to Date

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1951	I. C. Anderson	Root tip absorption	10 mc S ³⁵	Completed
1951	I. C. Anderson	Root tip absorption	20 mc P ³²	Completed
1951	N. S. Hall	Hornworm in tobacco	25 mc P ³²	Completed
1951	I. C. Anderson	Sugar distribution in tobacco	0.5 mc C ¹⁴	Completed
1952	S. B. Tove	Metabolism studies	1 mc C ¹⁴	Active
1952	D. S. Grosch	Wasp sterilization studies	15 mc P ³²	Completed
1952	N. S. Hall	Diffusion in clay	40 mc Mo ⁹⁹	Completed
1952	S. B. Tove	Metabolism studies in pigs	100 mc Cu ⁶⁴	Completed
1952	N. S. Hall	Field experiments with tobacco	35 mc P ³²	Completed
1952	N. S. Hall	Root absorption studies	35 mc P ³²	Completed
1952	N. S. Hall	Peach seedling absorption	6 mc Zn ⁶⁵	Completed
1952	N. S. Hall	Greenhouse studies	20 mc P ³²	Completed
1952	Herman Wiebe	Mineral absorption by roots	15 mc P ³² 1 mc S ³⁵ 1 mc Rb ⁸⁶	Completed
1952	N. S. Hall	Absorption studies	50 mc P ³²	Completed
1953	N. T. Coleman	Soil moisture studies	8.89 mc RaBe	Active
1953	N. S. Hall	Field experiments	30 mc Ca ⁴⁵	Completed
1953	N. S. Hall	Tracer experiments in plants	46 mc Mo ⁹⁹	Completed
1953	N. S. Hall	Greenhouse studies	130 mc K ⁴²	Completed
1954	S. B. Tove	Metabolism studies in cow	1 mc Mo ⁹⁹	Completed
1954	D. S. Grosch	Sterilization studies in wasp	30 mc Sr ⁸⁹	Completed
1954	C. K. Beck D. S. Grosch	Irradiation of wasp in reactor		Completed
1954	S. B. Tove	Metabolism studies in <u>S. lactis</u>	0.1 mc C ¹⁴	Completed

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1954	N. S. Hall	Study uptake of S in plants	60 mc S ³⁵	Completed
1954	N. S. Hall	Greenhouse study	40 mc P ³²	Completed
1954	S. B. Tove	Blood volume determination in sheep	1 mc I ¹³¹	Completed
1954	C. D. McAuliffe	Tracer studies in plants	0.1 mc P ³²	Completed
1954	C. D. McAuliffe	Tracer studies in plants	2 mc P ³²	Completed
1954	W. D. Whitehead, Jr. Gennard Matrone	Activation analysis of Mn samples		Completed
1954	S. B. Weed N. S. Hall	Tracer studies in plants	2 mc Ca ⁴⁵	Completed
1954	H. J. Evans	Tracer studies in plants	.02 mc P ³²	Completed
1954	H. J. Evans	Tracer studies in plants	10 mc P ³²	Completed
1955	L. A. Dean	Study effect of soil moisture or phosphorus uptake by plants	20 mc P ³²	Completed
1955	J. C. Osborne	Treat neoplasm in eyes of cow	4 mc Rn	Completed
1955	N. T. Coleman	Measure soil density	5 mc Co ⁶⁰	Active
1955	D. S. Grosch	Irradiation of small wasp for sterility studies		Inactive
1955	N. T. Coleman J. F. Lutz	Measure soil density based on gamma attenuation	5 mc Cs ¹³⁷	Active
1955	Gennard Matrone S. B. Tove R. H. Hartman W. D. Whitehead, Jr.	Study blood formation in animal	1 mc Fe ⁵⁹	Inactive
1956	F. J. Hassler	Study absorption of beta ray using cured and uncured tobacco	1 mc Cl ³⁶	Completed
1956	N. T. Coleman	Production of labeled plant materials	20 mc C ¹⁴	Active
1956	R. T. Gast	Measure incorporation of radioactivity into protein and nucleic acids of plants	0.1 mc C ¹⁴	Inactive

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1957	N. T. Coleman	Ion uptake, root distribution and phosphate reaction studies	20 mc P ³²	Active
1957	N. T. Coleman	Sulphate reactions and root distribution studies	10 mc S ³⁵	Active
1957	D. S. Grosch	Sterilization studies in a wasp	20 mc P ³²	Inactive
1957	N. T. Coleman	Study of rate of penetration and distribution of inorganic salts in wood	6 mc Hg ²⁰³	Active
1957	R. T. Gast	Labeling of DDT	0.5 mc Cl ³⁶	Inactive
1957	R. T. Gast	Labeling of insecticide	200 mc P ³² 10 mc S ³⁵	Completed
1957	N. T. Coleman	Soil moisture studies	5.2 mc RaBe	Active
1957	S. B. Tove	Study of metabolism of mice	1 mc C ¹⁴	Active
1957	N. T. Coleman	Root extension studies	126 mc P ³²	Active
1957	Gennard Matrone	Life span of the red blood cell in ruminants	1 mc C ¹⁴	Active
1957	Gennard Matrone	Fatty acids	12 mc C ¹⁴	Active
1957	N. T. Coleman	Root system of grass	40 mc P ³²	Active
1957	E. A. Ball	Metabolism study of plants	S ³⁵ , P ³²	Inactive
1957	E. A. Ball	Metabolism study of plants	C ¹⁴ , S ³⁵ , P ³²	Inactive
1957	D. R. Walker	To study the assimilation of urea nitrogen by use of the carbon urea	C ¹⁴	Completed
1957	R. T. Gast F. E. Guthrie	To study the nicotine metabolism in insects	C ¹⁴	Active
1958	N. T. Coleman R. E. Williamson	Measuring the density of thin sections of plant tissue or layers of soil in which plant roots may be grown	Kr ⁸⁵	Inactive
1958	N. T. Coleman	Studies relating to fission product reactions in soils and uptake by plants and is part of project sponsored by AEC	Sr ⁸⁹	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1958	N. T. Coleman Doris Craig	Studies relating to fission product reactions in soils and uptake by plants and is part of project sponsored by AEC	Ca ⁴⁵	Active
1958	S. B. Tove R. L. Anderson	Metabolism studies	C ¹⁴	Active
1958	N. T. Coleman	To determine density of wood	1 mc Pb ²¹⁰	Active
1958	E. A. Ball F. S. Barkalow, Jr.	Trace activities of harvest mouse	38 mc Au ¹⁹⁸	Completed
1958	Gennard Matrone	To determine mode of action of toxic levels of zinc on metabolism of copper	5 mc Cu ⁶⁴ 1 mc Zn ⁶⁵	Active
1958	N. T. Coleman	Plant studies	5 mc C ¹⁴	Active
1958	E. A. Ball	Studies concerning the translocation of carbon compounds from corn to the parasite witchweed	0.2 mc C ¹⁴	Active
1959	H. J. Evans H. V. Marsh	Determine factors limiting biosynthesis of plant heme compounds and chlorophyll	2 mc C ¹⁴	Active
1959	Shaukat Ahmed H. J. Evans	Cobalt metabolism in plants	0.1 mc Co ⁶⁰	Active
1959	S. B. Tove	To isolate plant nucleotides by chromatography	50 µc P ³²	Active
1959	H. J. Evans	To isolate phosphorylated compounds by paper chromatography	50 µc	Active
1959	Gennard Matrone Daniel Fromm C. H. Hill	Determining body water of chickens with I ¹³¹ labeled 4-iodoantipyrine	1 mc I ¹³¹	Active
1959	N. T. Coleman W. L. Rivenbark	Determine rate of Mn uptake	10 mc Mn ⁵⁶	Active
1960	Doris Craig W. A. Jackson	Determine effects of Al and Ca on uptake and transport of Rb in plants and plant tissue	Rb ⁸⁶	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1960	S. B. Tove	For the detection of lipase action by enzymes separated on paper or gel by electrophoresis	8.5 mc Ba ¹⁴⁰	Active
1960	S. B. Tove Gennard Matrone	Neutron activation of paper	10 ⁻³ mc Ba ¹³⁹	Active
1960	P. E. Gatterdam	Determining the deposition of Cl ¹⁴ labeled insecticides in tobacco	50 mc C ¹⁴	Active
1960	D. E. Moreland	Triazine studies in cotton plants	2 mc C ¹⁴	Active
1960	Doris Craig W. A. Jackson	To obtain exchange isotherms for Cs-Al and Cs-Ca clay and resin systems and information on Cs-fixation by clay minerals	1 mc Cs ¹³⁷	Active
1960	H. J. Evans L.A. Whitford	Determine Green Algae uptake of P ³²	1 mc P ³²	Active
1960	Doris Craig W. A. Jackson C. A. Brim	Soybean pollen studies	0.1 mc C ¹⁴	Active
1960	S. B. Tove Students	Student laboratory work in Biochemistry	0.5 mc P ³²	Active
1960	Gennard Matrone E. L. Thompson	Blood to Rumen and Rumen to blood transfer of sodium in sheep	6 mc Na ²⁴	Active
1961	B. J. Zobel R. L. McElwee	Pollen flight studies	15 mc P ³²	Active
1961	P. E. Gatterdam T. G. Bowery	Study dissipation of C ¹⁴ labeled Thiordan residues under field conditions	20 mc C ¹⁴	Active
1961	S. B. Tove	Tritiated organic compounds (occasionally, as T ₂ O) such as fatty acids or glycerol for enzyme studies	100 mc Tritium	Active
1961	P.E. Gatterdam T. G. Bowery	Processing and radio-assay of alfalfa treated with Thiordan-Carbon ¹⁴	20 mc C ¹⁴	Active
1961	Gennard Matrone H. A. Ramsey	To study the rate of metabolism and the intermediates in the metabolism of volatile fatty acids administered to young calves	30 mc C ¹⁴	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1961	Gennard Matrone J. S. Kahn	Enzyme reaction studies	1 mc C ¹⁴ 10 mc P ³²	Active
1961	J. S. Kahn	Enzyme reaction studies	1 mc C ¹⁴ 10 mc P ³²	Active
1961	Ernest Hodgson	Insect metabolism studies	1.0 mc P ³² 1.0 mc C ¹⁴	Active
1961	J. B. Evans S. B. Tove	Study metabolic pathways in certain bacteria	1 mc C ¹⁴	Active
1961	W. A. Jackson Doris Craig	Cesium uptake by plants	0.3 mc Cs ¹³⁷	Active
1962	H. D. Bowen	Ion source in measuring the average space charge of a low velocity dust stream	100 Microcuries Po ²¹⁰	Active
1962	J. G. Lecce	X-ray exposure of baby pigs at Wake Memorial Hospital		Active
1962	D. E. Moreland	Investigate the uptake and subsequent metabolism of Cl ³⁶ - ring labeled pro- metryne by cotton plants	1 Millicurie Cl ³⁶	Active
1962	W. L. Rivenbark R. P. Upchurch	Determine the mechanisms and forces responsible for the retention and reaction of organic chemicals in soils	1 Millicurie Cl ³⁶	Active
1962	W. A. Jackson Doris Craig	Root extension and distribution studies	24 Millicuries Rb ⁸⁶	Active

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE
Report of the
Subcommittee on Agriculture
June 21, 1962

Nuclear Energy Activities Relating to Agriculture in North Carolina

The use of nuclear energy in agricultural research in North Carolina was initiated in 1949 when an attempt was made to determine the effects of ionizing radiation on the genetic constitution of the peanut. This adventure is one of the success stories in agricultural research in this state.

The use of nuclear energy in the agricultural research program has continued with a gradually increasing tempo for the past thirteen years. The greater portion of this work has been through the use of various radioisotopes as laboratory tracer tools in the study of mineral metabolism of both plants and animals. Studies have also involved the use of ionizing radiation to affect genetic, reproductive or physiological behavior in biological materials. Labeled radioisotopes were first used in the North Carolina Agricultural Experiment Station in 1951. During that year four studies were initiated using various labeled minerals in metabolism studies. Since then, 92 projects have been activated. In 1961 alone, ten programs were started involving inorganic as well as organic labeled compounds. The number of projects initiated does not truly indicate the volume of research being conducted using this particular tool. A list of projects involving the use of radioisotopes, by year of initiation, is appended. This list does not accurately reflect the total use of nuclear energy in agricultural research since many biological radiation studies have been initiated at State College, at Brookhaven, at Oak Ridge, and at the Savannah Laboratories.

The use of nuclear energy in agricultural research may be divided into four general categories. These categories follow logical sequence in the development of this research. In the beginning, radioactive or marked materials were used as tracers for a specific mineral in metabolism studies of plants and animals. A second area of study included the effects of radiation on all biological materials.

At first, major concern in this area dealt with the survival of biological materials and the nature and magnitude of the genetic changes that were induced in plant and animal populations through its use. Later studies were more concerned with effects on reproduction and physiology. The third general category is the consequence of the normal development of the first. One or more organic elements used as tracers or markers have been incorporated into organic compounds; thus, the organic compounds so marked have made available a new tool for the study of intermediary metabolism. This isotope tool allows the biochemist, whether he be interested in plant, animal or human physiology, to more completely understand the functions of the marked organic compounds in the total metabolic processes of the biological material, and thus to learn of the role and ultimate fate of the organic constituents of plant and animal life. The fourth development involves the use of ionizing radiation in the processing, packaging and preservation of human foods. Undoubtedly, the military services have made heavy investments in this area, but the products of their efforts are not in evidence to the consuming public.

A major opportunity for the economic expansion of nuclear energy activity related to agriculture is to be expected in the fields of food processing and preservation. Much work must be done at the more basic research levels, particularly in those areas involving an understanding of the metabolic and enzymatic changes during processing and preservation of both plant and animal materials, before the challenges of this opportunity are available. Such research can only be truly fruitful through a cooperative coordinated research team involving personnel trained in the basic disciplines of both biological and physical sciences. Our greatest concern is the availability of scientific manpower with the training, ability, ideas, and enthusiasm to make research progress in these areas. Present facilities available to agricultural research scientists at North Carolina State College are being used at their maximum capacity.

List of Research Projects Involving the Use of Radioisotopes
in the
Agricultural Research Program at North Carolina State College
From 1951 to Date

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1951	I. C. Anderson	Root tip absorption	10 mc S ³⁵	Completed
1951	I. C. Anderson	Root tip absorption	20 mc P ³²	Completed
1951	N. S. Hall	Hornworm in tobacco	25 mc P ³²	Completed
1951	I. C. Anderson	Sugar distribution in tobacco	0.5 mc C ¹⁴	Completed
1952	S. B. Tove	Metabolism studies	1 mc C ¹⁴	Active
1952	D. S. Grosch	Wasp sterilization studies	15 mc P ³²	Completed
1952	N. S. Hall	Diffusion in clay	40 mc Mo ⁹⁹	Completed
1952	S. B. Tove	Metabolism studies in pigs	100 mc Cu ⁶⁴	Completed
1952	N. S. Hall	Field experiments with tobacco	35 mc P ³²	Completed
1952	N. S. Hall	Root absorption studies	35 mc P ³²	Completed
1952	N. S. Hall	Peach seedling absorption	6 mc Zn ⁶⁵	Completed
1952	N. S. Hall	Greenhouse studies	20 mc P ³²	Completed
1952	Herman Wiebe	Mineral absorption by roots	15 mc P ³² 1 mc S ³⁵ 1 mc Rb ⁸⁶	Completed
1952	N. S. Hall	Absorption studies	50 mc P ³²	Completed
1953	N. T. Coleman	Soil moisture studies	8.89 mc RaBe	Active
1953	N. S. Hall	Field experiments	30 mc Ca ⁴⁵	Completed
1953	N. S. Hall	Tracer experiments in plants	46 mc Mo ⁹⁹	Completed
1953	N. S. Hall	Greenhouse studies	130 mc K ⁴²	Completed
1954	S. B. Tove	Metabolism studies in cow	1 mc Mo ⁹⁹	Completed
1954	D. S. Grosch	Sterilization studies in wasp	30 mc Sr ⁸⁹	Completed
1954	C. K. Beck D. S. Grosch	Irradiation of wasp in reactor		Completed
1954	S. B. Tove	Metabolism studies in <u>S. lactis</u>	0.1 mc C ¹⁴	Completed

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1954	N. S. Hall	Study uptake of S in plants	60 mc S ³⁵	Completed
1954	N. S. Hall	Greenhouse study	40 mc P ³²	Completed
1954	S. B. Tove	Blood volume determination in sheep	1 mc I ¹³¹	Completed
1954	C. D. McAuliffe	Tracer studies in plants	0.1 mc P ³²	Completed
1954	C. D. McAuliffe	Tracer studies in plants	2 mc P ³²	Completed
1954	W. D. Whitehead, Jr. Gennard Matrone	Activation analysis of Mn samples		Completed
1954	S. B. Weed N. S. Hall	Tracer studies in plants	2 mc Ca ⁴⁵	Completed
1954	H. J. Evans	Tracer studies in plants	.02 mc P ³²	Completed
1954	H. J. Evans	Tracer studies in plants	10 mc P ³²	Completed
1955	L. A. Dean	Study effect of soil moisture or phosphorus uptake by plants	20 mc P ³²	Completed
1955	J. C. Osborne	Treat neoplasm in eyes of cow	4 mc Rn	Completed
1955	N. T. Coleman	Measure soil density	5 mc Co ⁶⁰	Active
1955	D. S. Grosch	Irradiation of small wasp for sterility studies		Inactive
1955	N. T. Coleman J. F. Lutz	Measure soil density based on gamma attenuation	5 mc Cs ¹³⁷	Active
1955	Gennard Matrone S. B. Tove R. H. Hartman W. D. Whitehead, Jr.	Study blood formation in animal	1 mc Fe ⁵⁹	Inactive
1956	F. J. Hassler	Study absorption of beta ray using cured and uncured tobacco	1 mc Cl ³⁶	Completed
1956	N. T. Coleman	Production of labeled plant materials	20 mc C ¹⁴	Active
1956	R. T. Gast	Measure incorporation of radioactivity into protein and nucleic acids of plants	0.1 mc C ¹⁴	Inactive

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1957	N. T. Coleman	Ion uptake, root distribution and phosphate reaction studies	20 mc P ³²	Active
1957	N. T. Coleman	Sulphate reactions and root distribution studies	10 mc S ³⁵	Active
1957	D. S. Grosch	Sterilization studies in a wasp	20 mc P ³²	Inactive
1957	N. T. Coleman	Study of rate of penetration and distribution of inorganic salts in wood	6 mc Hg ²⁰³	Active
1957	R. T. Gast	Labeling of DDT	0.5 mc Cl ³⁶	Inactive
1957	R. T. Gast	Labeling of insecticide	200 mc P ³² 10 mc S ³⁵	Completed
1957	N. T. Coleman	Soil moisture studies	5.2 mc RaBe	Active
1957	S. B. Tove	Study of metabolism of mice	1 mc C ¹⁴	Active
1957	N. T. Coleman	Root extension studies	126 mc P ³²	Active
1957	Gennard Matrone	Life span of the red blood cell in ruminants	1 mc C ¹⁴	Active
1957	Gennard Matrone	Fatty acids	12 mc C ¹⁴	Active
1957	N. T. Coleman	Root system of grass	40 mc P ³²	Active
1957	E. A. Ball	Metabolism study of plants	S ³⁵ , P ³²	Inactive
1957	E. A. Ball	Metabolism study of plants	C ¹⁴ , S ³⁵ , P ³²	Inactive
1957	D. R. Walker	To study the assimilation of urea nitrogen by use of the carbon urea	C ¹⁴	Completed
1957	R. T. Gast F. E. Guthrie	To study the nicotine metabolism in insects	C ¹⁴	Active
1958	N. T. Coleman R. E. Williamson	Measuring the density of thin sections of plant tissue or layers of soil in which plant roots may be grown	Kr ⁸⁵	Inactive
1958	N. T. Coleman	Studies relating to fission product reactions in soils and uptake by plants and is part of project sponsored by AEC	Sr ⁸⁹	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1958	N. T. Coleman Doris Craig	Studies relating to fission product reactions in soils and uptake by plants and is part of project sponsored by AEC	Ca ⁴⁵	Active
1958	S. B. Tove R. L. Anderson	Metabolism studies	C ¹⁴	Active
1958	N. T. Coleman	To determine density of wood	1 mc Pb ²¹⁰	Active
1958	E. A. Ball F. S. Barkalow, Jr.	Trace activities of harvest mouse	38 mc Au ¹⁹⁸	Completed
1958	Gennard Matrone	To determine mode of action of toxic levels of zinc on metabolism of copper	5 mc Cu ⁶⁴ 1 mc Zn ⁶⁵	Active
1958	N. T. Coleman	Plant studies	5 mc C ¹⁴	Active
1958	E. A. Ball	Studies concerning the translocation of carbon compounds from corn to the parasite witchweed	0.2 mc C ¹⁴	Active
1959	H. J. Evans H. V. Marsh	Determine factors limiting biosynthesis of plant heme compounds and chlorophyll	2 mc C ¹⁴	Active
1959	Shaukat Ahmed H. J. Evans	Cobalt metabolism in plants	0.1 mc Co ⁶⁰	Active
1959	S. B. Tove	To isolate plant nucleotides by chromatography	50 µc P ³²	Active
1959	H. J. Evans	To isolate phosphorylated compounds by paper chromatography	50 µc	Active
1959	Gennard Matrone Daniel Fromm C. H. Hill	Determining body water of chickens with I ¹³¹ labeled 4-iodoantipyrine	1 mc I ¹³¹	Active
1959	N. T. Coleman W. L. Rivenbark	Determine rate of Mn uptake	10 mc Mn ⁵⁶	Active
1960	Doris Craig W. A. Jackson	Determine effects of Al and Ca on uptake and transport of Rb in plants and plant tissue	Rb ⁸⁶	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1960	S. B. Tove	For the detection of lipase action by enzymes separated on paper or gel by electrophoresis	8.5 mc Ba ¹⁴⁰	Active
1960	S. B. Tove Gennard Matrone	Neutron activation of paper	10 ⁻³ mc Ba ¹³⁹	Active
1960	P. E. Gatterdam	Determining the deposition of C ¹⁴ labeled insecticides in tobacco	50 mc C ¹⁴	Active
1960	D. E. Moreland	Triazine studies in cotton plants	2 mc C ¹⁴	Active
1960	Doris Craig W. A. Jackson	To obtain exchange isotherms for Cs-Al and Cs-Ca clay and resin systems and information on Cs-fixation by clay minerals	1 mc Cs ¹³⁷	Active
1960	H. J. Evans L.A. Whitford	Determine Green Algae uptake of P ³²	1 mc P ³²	Active
1960	Doris Craig W. A. Jackson C. A. Brim	Soybean pollen studies	0.1 mc C ¹⁴	Active
1960	S. B. Tove Students	Student laboratory work in Biochemistry	0.5 mc P ³²	Active
1960	Gennard Matrone E. L. Thompson	Blood to Rumen and Rumen to blood transfer of sodium in sheep	6 mc Na ²⁴	Active
1961	B. J. Zobel R. L. McElwee	Pollen flight studies	15 mc P ³²	Active
1961	P. E. Gatterdam T. G. Bowery	Study dissipation of C ¹⁴ labeled Thiodan residues under field conditions	20 mc C ¹⁴	Active
1961	S. B. Tove	Tritiated organic compounds (occasionally, as T ₂ O) such as fatty acids or glycérol for enzyme studies	100 mc Tritium	Active
1961	P.E. Gatterdam T. G. Bowery	Processing and radio-assay of alfalfa treated with Thiodan-Carbon ¹⁴	20 mc C ¹⁴	Active
1961	Gennerd Matrone H. A. Ramsey	To study the rate of metabolism and the intermediates in the metabolism of volatile fatty acids administered to young calves	30 mc C ¹⁴	Active

<u>Date</u>	<u>Principal Investigator</u>	<u>Experiment</u>	<u>Activity</u>	<u>Status</u>
1961	Gennard Matrone J. S. Kahn	Enzyme reaction studies	1 mc C ¹⁴ 10 mc P ³²	Active
1961	J. S. Kahn	Enzyme reaction studies	1 mc C ¹⁴ 10 mc P ³²	Active
1961	Ernest Hodgson	Insect metabolism studies	1.0 mc P ³² 1.0 mc C ¹⁴	Active
1961	J. B. Evans S. B. Tove	Study metabolic pathways in certain bacteria	1 mc C ¹⁴	Active
1961	W. A. Jackson Doris Craig	Cesium uptake by plants	0.3 mc Cs ¹³⁷	Active
1962	H. D. Bowen	Ion source in measuring the average space charge of a low velocity dust stream	100 Microcuries Po ²¹⁰	Active
1962	J. G. Lecce	X-ray exposure of baby pigs at Wake Memorial Hospital		Active
1962	D. E. Moreland	Investigate the uptake and subsequent metabolism of C ¹⁴ - ring labeled pro- metryne by cotton plants	1 Millicurie C ¹⁴	Active
1962	W. L. Rivenbark R. P. Upchurch	Determine the mechanisms and forces responsible for the retention and reaction of organic chemicals in soils	1 Millicurie C ¹⁴	Active
1962	W. A. Jackson Doris Craig	Root extension and distribution studies	24 Millicuries Rb ⁸⁶	Active

NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

Report of the Subcommittee on Radiation Standards January 22, 1962

The following three specific areas have been considered as having immediate importance for the Committee's attention, support, and action:

1. Development of the technological facilities, including equipment and trained personnel, within the State Board of Health for the proper maintenance of radiation standards.
2. Dissemination to the public of recommendations concerning fallout radiation measuring instruments, and investigation of improvements in such instruments from the standpoints of reliability, economy, and use by the general public.
3. Development of the atomic energy facilities at N. C. State College for research and experimental work in the various areas leading to better economic utilization, new uses, and including fundamental investigations, in atomic energy.

The first two items above are clearly necessary and current activities that demand consideration. The radiological facilities of the State Board of Health require expansion and improvement in order to fulfill the requirements specified by both the general statutes of North Carolina and the responsibility of safe-guarding the public health. The consideration of instruments for measuring fallout radiation stems from the fact that the general public has little or no knowledge of the types of instruments, their uses, or their importance to survival. It is also apparent that the Civil Defense radiation monitoring systems may not be adequate to properly monitor many areas or inform individual families of the pertinent fallout situations.

The third item considered, namely development of atomic energy facilities at State College, has a broader range of importance than applications to the subject of "Radiation Standards" which is delegated to this subcommittee. Development of industry and technology in atomic energy within the State will be affected by the research and experimental work done at State College which has the only reactor facilities in North Carolina. North Carolina already has a substantial investment in these reactor facilities which were constructed primarily for education and training. Additional financial support would make possible the expansion of the research program.

Recommendations follow for each of these areas of interest.

RECOMMENDATIONS

I. Radiological Facilities for the State Board of Health

The needs for personnel and facilities have been thoroughly studied by the State Board of Health and in consultation with members of this subcommittee and with U. S. Public Health advisors. Since the radiological activities of the State Board of Health are coordinated by Dr. W. L. Wilson, it is our recommendation that the Committee assist him in all ways possible to obtain the required funds. It may be that this Committee can help to express the urgency and importance of this matter.

II. Fallout Radiation Measuring Instruments

The following statement is quoted from OCDM Advisory Bulletin No. 254(1960):

"As a supplement to organized Federal, State, and local monitoring systems, every home and community shelter should have an instrument to measure radiation dose rate—a ratemeter. In the event of nuclear attack, such an instrument should provide information that will help the user determine the degree of fallout danger he faces, and help him make logical decisions for greater safety. For example, a citizen's radiation instrument should help the user determine when to take shelter, when to leave the shelter, and how long it would be advisable to remain in an unprotected area. The instrument also should be of value in locating that portion of the home or protective structure which offers the best protection from fallout."

There are a wide variety of portable radiation monitoring instruments, a number of which meet the requirements for measuring fallout radiation, that are available to the public. Two types of instruments have been selected as being most suitable as citizen's instruments. While several firms supply these instruments, the firms listed below offer them, to the best of our knowledge, at the lowest price.

- (a) The Victoreen Instrument Company
5806 Hough Avenue
Cleveland 3, Ohio

Model 61720 Fallout Detection Meter

<u>Quantity</u>	<u>Unit Price</u>
1-11	\$49.95
12-35	39.95
36 or more	30.95

This is a portable, rugged transistorized ionization chamber instrument which operates on two flashlight batteries.

(b) Bendix Aviation Corporation
3130 Wasson Road
Cincinnati 8, Ohio

Kit #2 - \$24.95

- 1 - CDV 736 Personal Ratemeter
- 1 - CDV 746 Personal Dosimeter, 0-600R
- 1 - CDV 756 Personal Dosimeter Charger

These are self-reading type pocket ionization chambers. The charger unit uses one flashlight battery. The CDV 736 has two scales, one of which reads 12 r/hr and the other reads 120 r/hr. This chamber is used in conjunction with a watch or other timer.

The Victoreen instrument is preferred because it gives immediate, direct measurement of radiation. Other instruments, presently under development, are listed below.

<u>Description</u>	<u>Ranges</u>	<u>Accuracy(%)</u>	<u>Manufacturer</u>
1. Portable G-M, transistorized, for public; 2 D-size cells, detects y.	0-100 r/hr	± 35	Lionel
2. Same as 1. but incorporated in portable broadcast receiver; for public.	0-100 r/hr	± 35	Lionel
3. Portable; based on quartz-fiber dosimetry; detects y; for public.	0-100 r/hr	± 35	Bendix
4. Remote-reading shelter meter with probe on 200 ft. cable; 12-volt cell; detects y.	1-1000 r/hr	± 20	ORNL
5. Portable, pocket size.	1-100 r/hr	(\$49)	Gelman

Most geiger counter instruments are not recommended. However, it is conceivable that a wide range G-M tube type instrument could be developed that would act as a counter for low radiation intensities and as an ionization chamber for higher intensities. This type of instrument would offer the advantage of allowing detection of contaminated materials such as food and water, as well as permitting measurement of high dose rates. Investigation into this type of instrument might be fruitful.

The general OCD criteria for a citizen's radiation instrument are stated below. However, a further vital recommendation is included here. Namely, included with each instrument should be specific information as follows: operating and maintenance instructions, a discussion

of what the meter readings mean and how they are to be interpreted, and a chart or plaque giving operating instructions and selected dose and dose rate interpretations.

Characteristics OCD considers essential for home and community survey meters are:

1. Cost - no more than \$15 each, in lots of 40,000 or more.
2. Reliability - 5 years or more of storage (except batteries).
3. Ease of operation and interpretation - special training for use should not be required.
4. Range - 1 to 100 r/hr for gamma dose rate.
5. Accuracy - better than $\pm 35\%$ reference Co^{60} , all dose rates.
6. Beta Shielding - 1,000 mg/cm².
7. Built in circuit check.
8. Indicator - calibrated in roentgens/hour (not tones, color, brightness, etc.).
9. Off-scale reading - give positive indication when dose rate is higher than 100 r/hr.
10. Battery life - when instrument reads 50 r/hr or more, battery life should be 50 hours.

III. Development of N. C. State College Atomic Energy Facilities

A substantial program of atomic energy activities has been in existence at State College since about 1950. Much progress has been made, particularly in the area of educating nuclear engineers which was the primary objective of the program. It is safe to say that there are no major nuclear energy industries or organizations in the country which do not have State College graduates on their staff. Nuclear Engineering has been made a separate department after 10 years of growth in the Department of Physics.

Research using the Reactor facilities has been properly integrated with the overall educational program in nuclear science and engineering. The facilities are flexible enough to accommodate a sizeable amount of sponsored research for industry and governmental agencies. This is now being done to a modest degree, again closely associated with the graduate educational program. It might be desirable for this Committee, through the University and College Administration, to explore the possibility of expanding the research activities, to provide that leadership in atomic energy research which has been attained by the College in the educational field. Such an endeavor would require additional staff and equipment. Discussion along these lines is recommended.

Respectfully submitted,

A. C. Menius, Jr., Chairman
Subcommittee on Radiation Standards

E. Jack Story

W. L. Wilson

COPY

COPY

Duke University Medical Center
Durham, North Carolina

October 9, 1962

Mr. Agnew H. Bahnson, Jr.
Postoffice Box 367
Winston-Salem, North Carolina

Dear Mr. Bahnson:

I have the pleasure of presenting the Report of the Subcommittee on Medicine and Public Health to you. In the interests of time and our recent correspondence, I am sending copies to members of the Subcommittee and to members of the Subcommittee on Education and Research. I shall ask these members to forward indicated additions or deletions to your office directly.

Appendices A, B, C, D and E are from my own personal files and exist as well in the files of our Subcommittee members. Appendices F and G represent new material and I am forwarding appropriate copies to the members of the two Subcommittees.

With my kindest personal regards, I am

Sincerely yours,

s/t

Barnes Woodhall, M.D.
Dean
Duke University Medical Center

BW:ht

cc: Dr. C. C. Carpenter
Dr. Henry T. Clark, Jr.
Dr. Gerald Edwards
Dr. J. W. R. Norton
Mr. William F. Henderson
Dr. Paul Gross
Dr. Charles F. Carroll
Dr. John I. Hopkins
Dr. Leo W. Jenkins
Dr. Lauchlin M. Currie

VIII

REPORT ON SUBCOMMITTEE ON MEDICINE AND PUBLIC HEALTH

October 10, 1962

The activities and objectives of this Committee are inextricably and fortunately involved with ongoing responsibilities of the North Carolina State Board of Health related to public health, the educational and research pursuits and potentials of the excellent University systems of this State, the broad interests of organized medicine and the very valid health goals of the citizens of the State. This brief Report comments upon progress in these areas of concern.

The forceful leadership in this area of public health by the State Health Director is evinced quite clearly by the memoranda dated July 3, August 30, September 6, and September 13 (Appendices A,B,C and D) that are related to radiation protection standards - fallout surveillance.

APPENDIX A:

Biennial Review of North Carolina State Radiological Health Program 28-30 May 1962

APPENDIX B:

Application of Radiation Protection Standards-Fallout

APPENDIX C:

Application of Radiation Protection Standards-Fallout Supplement One

APPENDIX D:

Notes On Fallout Surveillance

The Subcommittee recommends further and wishes to accept the action noted under APPENDIX D, IX, reprinted below:

IX. ACTION RECOMMENDED TO BE TAKEN AT THIS TIME BY NORTH CAROLINA ATOMIC ENERGY ADVISORY COMMITTEE

A. Designate one Sub-Committee (Medicine and Public Health?) of the whole Committee to accept responsibility for

1. Keeping closely informed by the State Health Director of the changing facts, factors, and status of fallout, fallout surveillance

effectiveness of surveillance, countermeasures recommended, and effectiveness of countermeasures, in North Carolina

2. Presenting to the Committee Chairman recommended interim and quarterly actions by the Committee deemed necessary to be taken henceforth, with reference to fallout and fallout surveillance.

B. Formal expression of any recommendations to the State Board of Health of additional action(s) the Committee considers the Board may take, to meet the Board's responsibilities related to fallout surveillance and measures made necessary by fallout.

C. Formal favorable expression through timely letters signed by the Committee Chairman to the Governor, members of the Advisory Budget Commission, and General Assembly, of the results of the Atomic Energy Advisory Committee's evaluation of the foregoing study, recommendations, and proposals, as visualized by Chapter 104C-2, 1959 Atomic Energy Act (c.481, s.3).

The Subcommittee commends and seeks all feasible support for the following educational and research proposals that have been initiated respectively by the School of Public Health, the University of North Carolina and by the Duke University Medical Center.

The details of the original proposal made by the University of North Carolina to the U. S. Atomic Energy Commission are found in APPENDIX E entitled, "Establishment of an Institute in Fundamentals of Radiation and Radiological Protection", under the date of January 15, 1962. This program was subsequently approved and has been established as a continuing educational endeavor.

The second educational program is concerned with a prototype study of the problem of fallout protection for Duke University - a population group of students, hospital patients, physicians and citizens of the City and County of Durham, North Carolina, numbering 25,000 people. This study was initiated on July 11, 1962 by the present Chairman of the Subcommittee and the engrossing minutiae of this continuing effort is found in APPENDIX F, "Progress Report Number 2, March 15, 1962, Duke University Fallout Preparedness Committee". The essentials of this program have been described to the Honorable Steuart Pittman, Assistant Secretary of Defense, by Duke University officials and will form some part of a nationwide educational program in this area of national defense. A corollary to this program is found in the Duke University Shelter Management Course, which will be

introduced in the City and County of Durham, North Carolina, on October 29. The course is described in APPENDIX G, "Duke University Shelter Management Course."

The Subcommittee possesses a strong sense of pride in these pioneering, original and responsible undertakings, designed by the State Board of Health and by the broad University leadership of the State. It recommends full executive and if necessary, fiscal, support for these and other programs that will inevitably develop.

Finally, the Subcommittee recommends the adoption, when feasible, of the following proposals, largely concerned with the medical profession of the State, but equally a task of vigorous leadership by members of that profession and by all educators involved in health matters. These proposals are as follows:

"1. Proposal: A symposium concerning the clinical uses of radio-isotopes be instituted. Such a symposium to stress the hows and whys of clinical radioisotopes and be directed primarily toward the private and/or small clinic physician.

Procedure: It is recommended that the Chairman, the Subcommittee on Medicine and Public Health, contact the Secretary, American Academy of General Practice, North Carolina Chapter, and the Secretary, the North Carolina Medical Society, suggesting the institution of such a symposium.

Purpose: To acquaint physicians with the procedures and techniques used in clinical radioisotopes, stressing the training and equipment necessary for such usage.

2. Proposal: The assembly and dissemination of information relative to medical radioisotope courses currently conducted within North Carolina, together with data on radioisotope courses available to medical technicians.

Procedure: The Chairman, the Subcommittee on Medicine and Public Health, forward a letter to each institution within North Carolina which conducts or is believed to conduct courses in medical radioisotope technology. Purpose of the letter would be to determine availability, scheduling, pre-requisites, and curriculum of such courses. Upon consolidation of this information it may be possible to disseminate a brochure describing such courses.

Purpose: To stimulate the medical use of radioisotopes through the attendance of physicians in specialized courses. We believe the lack of

radioisotope usage in medicine is due in part to a misunderstanding of the qualifications and training required to obtain an AEC license for diagnostic and/or therapeutic radioisotope use. This situation may be overcome by making available information relative to the availability of courses in this field.

3. Proposal: The establishment of a complete nuclear medicine center to include a medical research reactor and radioisotope processing facility.

Procedure: The Chairman, the Subcommittee on Medicine and Public Health, forward a letter of inquiry to all institutions within the State known to have active nuclear medicine programs. Purpose of this letter is to determine the interest in such a program and attempt to determine the feasibility of conducting such a program on a joint institution basis.

Purpose: At present there are only two medical research reactors currently in operation in the United States. It would appear that such a project would have a great deal of benefit to the State of North Carolina. Cost involved in such a project would be quite reasonable in view of the AEC's willingness to subsidize such projects."

Some part of the necessary activities of these proposals has already been initiated after discussion with the Chairman, NCAEAC, and with Dr. J. W. R. Norton, State Health Director. The members of this Committee are confident that the proved capabilities and the potential that exists in the various agencies and institutions and medical personnel of this State are fully capable of understanding, resolving and placing into operation such facilities and proposals that are pertinent to the health of the citizens of our State, as this function is related to atomic energy.

Very respectfully submitted,

s/t

Barnes Woodhall, M.D.
Dean
Duke University Medical Center

BW:ht

CAROLINA POWER & LIGHT COMPANY
Raleigh, North Carolina

April 3, 1962

Mr. A. H. Bahnson, Jr., Chairman
N. C. Atomic Energy Advisory Committee
P. O. Box 367
Winston-Salem, North Carolina

Dear Mr. Bahnson:

As requested in your memorandum of March 23, with respect to atomic energy used in the production of power, I wish to make the following report:

A. Report of Short-run Opportunities

A nuclear reactor project now under construction at Parr, S. C., financed jointly by three North Carolina power companies and one South Carolina power company, is expected to be in operation sometime during the third quarter of 1962.

The primary function of this project is research and exploration, looking toward economic power production by use of atomic energy; and is a prototype, of a full size plant. The steam generator using nuclear fuel is expected to produce steam sufficient to generate 17,000 kilowatts of electric energy.

The second purpose, and equally as important, is the training of personnel in the design, operation and maintenance of atomic reactors.

B. Long-run Study for North Carolina

The three major power companies in North Carolina have been and will continue to be active in looking for ways and means of producing power from atomic energy at a lower overall cost than they are now able to produce from fossil fuels. While atomic energy power is not now competitive with power produced through fossil fuels in this particular area, it is expected that in the not too distant future it will become competitive. The training of personnel, as outlined above, in the Parr Project will enable the power companies serving the citizens of North Carolina to take full advantage of an economic break-through when it does occur.

Yours very truly,

HBR:IC

H. B. Robinson - Chairman
Subcommittee on Power
N. C. Atomic Energy Advisory Committee

cc- Mr. E. C. Fiss
Mr. J. J. Hill
Dr. Leo W. Jenkins
Brig. Gen M. I. Shuford
Mr. R. H. Goodman
Dr. W. L. Wilson

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NELLO L. TEER COMPANY
Contractors
Durham, North Carolina

COPY

Nello L. Teer, Jr.
President

December 13, 1962

Mr. Agnew H. Bahnson, Jr., Chairman
North Carolina Atomic Energy Advisory Committee
Winston-Salem, North Carolina

RE: Report of Subcommittee for Industry and Labor
North Carolina Atomic Energy Advisory Committee

Dear Agnew:

You will recall that I was appointed to the North Carolina Atomic Energy Advisory Committee effective October 1, 1962, and accordingly, my efforts and activities have been very brief.

A subcommittee consisting of Mr. Frank Crane, Mr. M. L. Shepard, and Dr. W. L. Wilson met with me at the North Carolina State Board of Health Building on November 26, 1962, and at that time the following was discussed:

Mr. Forest H. Shuford, II, a member of the Subcommittee who was unable to attend due to press of State business, forwarded to Dr. Wilson a copy of a suggested amendment to the Workmen's Compensation Act to provide for compensation for disability or death resulting from exposure to radioactive materials. The Subcommittee reviewed the suggested amendment, and although agreeing in principle with the desirability and objective of the amendment as submitted, felt that the terminology of such an amendment should be carefully prepared and properly screened by competent legal counsel in order to insure the maximum equity to employer and employee alike. It was also recognized that other states have already amended their Workmen's Compensation Acts to meet the modern requirements resulting from the development of atomic energy, and that much help and benefit could result from a study of the various actions of other states in this connection. Considering the complexity of the problem and the desire of the Subcommittee not to submit an inadequate amendment, we recommend that the North Carolina Industrial Commission and any other appropriate agency give careful study to the problem at hand with the objective being to submit to the coming General Assembly a suitable amendment to the Workmen's Compensation Act that will provide Compensation for disability or death resulting from exposure to radioactive materials.

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Mr. Agnew H. Bahnson Page Two December 13, 1962

The Subcommittee additionally discussed the prospects and probabilities of the development of atomic industry and its related space activities in North Carolina, and recognizing this as a proper goal for the Department of Conservation and Development, the Subcommittee has prepared a resolution, copy of which is enclosed herewith, which we trust will meet with the approval of the Advisory Committee and be encompassed in its report to Governor Sanford.

During the coming year, the Subcommittee for Industry and Labor will have periodic meetings which we trust will result in beneficial activities related to the work of the Advisory Committee.

Trusting the above is satisfactory with you, and with much respect, I beg to remain,

Yours very truly,

s/t

Nello L. Teer, Jr.

NLTJr:sd

Enclosures

WHEREAS, the North Carolina Atomic Energy Advisory Committee was established by the General Assembly of North Carolina in 1959 with one of its purposes being to observe areas where the newly developed atomic industry might serve the people of the State of North Carolina;

WHEREAS, the Department of Conservation and Development has been entrusted by the General Assembly with the responsibility of aiding and promoting new industries for the increased growth of our State;

WHEREAS, the North Carolina Atomic Energy Advisory Committee recognizes that the Department of Conservation and Development is doing an outstanding job within the framework of its resources of manpower and funds; and

WHEREAS, the Department of Conservation and Development is already aware of the desirability of concentrating extra efforts in connection with the new industrial opportunities within the Atomic Energy Development.

Now, therefore, be it resolved that the North Carolina Atomic Energy Advisory Committee recommend to the Governor and to the General Assembly that such steps be taken to support the activities of the Department of Conservation and Development as are necessary for it to continue its search for additional new industry for North Carolina and particularly those in the fast-developing atomic and space related industries.

FLORIDA REPORT TO
SOUTHERN INTERSTATE NUCLEAR BOARD

Annual Meeting - April 12, 1962
Oak Ridge, Tennessee

Mr. Norton, Gentlemen, I am Robert H. Dunlap, Director of the Florida Nuclear Commission and alternate for Mr. Robert R. Guthrie, Chairman of the Commission and Governor Bryant's official representative to the Southern Interstate Nuclear Board.

Mr. Guthrie was unable to attend this meeting because of a schedule conflict, but asked me to relay his warm greetings to all of you.

I, for one, would like to know more than I do about the nuclear programs and organizations of our sister states. On the theory that others here may entertain a corresponding interest in ours, I do not propose to give a detailed report of the progress of Florida's nuclear program in the usual statistical sense, but will comment instead on what I believe to be some of the more unique aspects of our program and account for some of the operating philosophy behind it.

As is the case in most states, our Commission is concerned with public health and safety; the stimulation of public interest in the atom as a force for peace and a bet way of life; the general improvement of our industrial environment(not only for nuclear industries, but for other science-oriented "growth" industries); and, of course (like most states) we would like to attract our share of such new industries as are available.

In order to achieve these aims, we have directed much attention in the last year toward the refinement of our State nuclear organization (which incidentally has been in existence since 1955). The basic Commission consists of nine Governor-appointed industrial and business leaders and educators. In the appointment of these men, Governor Bryant has placed at the service of the State an array of talent that is formidable in its quality and scope. Much attention has been given this year to the development of an organization which would achieve the maximum utilization of this talent. I believe our success has been noteworthy.

Under Chairman Guthrie's energetic leadership the Commission has met over the past year at intervals of almost once a month to consider and advance our various projects. For a "volunteer" group of this calibre this is obviously an extremely heavy schedule. Mr. G. T. Willey, of Martin-Orlando, for example, is responsible for the performance of a plant employing over ten thousand people - many of them highly technical. A day absence from an operation of this type is not frivolously undertaken. Yet, Mr. Willey

..... continued

Florida Report

Page Two

April 12, 1962

Mr. Guthrie and other members, willingly gave two days of his time when the Commission met at Oak Ridge last fall. 100% attendance is not at all uncommon, and I'm sure that the acceptance by these men of this heavy schedule is a convincing tribute to Mr. Guthrie's leadership and the dedication of the Commission's members. This basic group can be extended as required through its Coordinating Council and its advisory committees to bring the varied talents of nearly 100 individuals to bear on the various aspects of our program.

To assure the State a truly comprehensive program, the Commission maintains a constant vigil over a broad front of activity. This vigilance pays off in the early identification of trends, and the prompt response to new developments. Our involvement in "Space," for example, started with meetings in January and March of last year to discuss state/federal cooperation in matters bearing on labor attitude and professional development at Cape Canaveral. In both cases, the Commission was actively cooperating in corrective measures when announcement of the nuclear rocket programs at the Cape last August decisively identified Florida with the national space effort.

Our most recent discussions with NASA, AEC, and the Air Force have concerned the safety aspects of the nuclear rocket programs. Although much remains to be done in the defining of the State's role in these programs, definite responsibilities in the public acceptance and health and safety aspects are readily identifiable. Professional development needs continue to exist and will increase. The Commission is actively cooperating with our universities and the federal establishment in meeting these needs.

Another quality of the Commission is its flexibility. Because of the rapid pace of development of nuclear and other technologies, frequent reappraisal of objectives and programs is a vital necessity. Changes in emphasis, and sometimes even direction, must occasionally be made. We have found this organization highly flexible in its response to such demands.

Characteristically, the Commission has been analytical and conservative in its approach to such matters as state assumption of controls over sources of radiation specified in Public Law 86-373. Parenthetically, I might say here that the Commission will consider at its April 30th meeting finalized data which will enable it to decide whether to proceed immediately in the matter of transfer.

As for nuclear-generated electric power: We had some frustration in the cancellation last year of our Florida West Coast Nuclear Group project, but there are encouraging indications. Our power companies have formed a Nuclear Power Study Group, under Chairman George Kinsman of Florida Power and Light Company (and SINB). This group is reviewing, with the reactor manufacturers, the latest concepts in reactor design.

..... continued

Florida Report

Page Three

April 12, 1962

Although the existing power in the state is generally regarded as ample, the power companies are watching the demand closely and are prepared to increase this capacity as soon as the need for it develops.

Projects which are developing particularly well are: A Speakers Bureau, which is presenting popular level talks and films to community groups throughout the state and a five-station coordinated educational television series which should be ready for inauguration in June.

One achievement of which the Nuclear Commission is particularly proud, and which is a vital element in the overall program, is the Florida Legislative Council's Interim Committee on Nuclear Legislation. This Committee formed as a result of a petition by the Nuclear Commission to the Legislative Council, provides in the state legislature a knowledgeable group with a specialized understanding of nuclear and other technological problems. This Committee could be compared to the congressional Joint Committee on Atomic Energy. Under the capable leadership of Representative Dick Mitchell, who is with us today, it has sponsored all of Florida's nuclear legislation. The Commission plans to request the Legislative Council to extend the scope of this Committee to deal with "space" related - as well as nuclear - considerations.

Generally speaking, I believe the operation of Florida's commission-type nuclear authority has been most reassuring. We are gratified that one of our compact states has seen fit to adopt a similar plan. We are confident that they will be as pleased with it as we are. For my part, I would unhesitatingly recommend it to any state that has not committed itself to another form. I would further recommend that any state that does not have a specific nuclear/space legislative committee should form one.

Florida is convinced of the bright future of the South and is anxious to make her contribution to regional progress. It has been my pleasure to work with Mr. Solomons and we have, on several occasions, invited him to participate in state meetings and activities. We are working on several projects of regional significance. I believe these are promising and can be brought to fruition. You can rely on Florida's continued and active cooperation.

For any of you who may be interested, I have some data on the Florida Nuclear Commission which I will gladly furnish.

*Because of Florida's heavy involvement in the national space program, it is regarded as likely that the scope of the Nuclear Commission's operations will be officially extended to cover the State's responsibilities in this area.

Robert H. Dunlap, Director
Florida Nuclear Commission
P. O. Box 1495
Tallahassee, Florida

Report - State of Kentucky

I. Philosophy of Development and Control

Kentucky's nuclear program is based on the premise that control and development of the peaceful atom is necessarily interdependent. Due to the hazards associated with the use of radioactive materials, it is difficult to speak of one without referring to the other and a healthy balance must be sought so as not to over-regulate or over-promote, without adequate safeguards, the use of radioactive materials in industry, agriculture and medicine. Kentucky's nuclear program, therefore, has two goals: (1) the maximum development of the peaceful atom for the benefit of our citizens, and (2) the protection of the health and safety of the public from hazards associated with the possession and use of radioactive materials.

II. Office of coordinator of Atomic Activities

On September 1, 1960, the Governor created the Office of Coordinator of Atomic Activities for the purpose of overseeing the development and regulatory activities of the state relating to sources of ionizing radiation in order to assure a proper balance between regulation and development of atomic energy, avoid overlapping, nonuniform, and conflicting programs, and to act as the Governor's personal advisor in matters relating to radiation.

III. Kentucky's Regulatory Program

Kentucky, on March 26, 1962, became the first state in the nation to assume from the Atomic Energy Commission authority to license the possession and use of byproduct, source, and special nuclear materials in less than a critical mass under a recent Congressional amendment to the Atomic Energy Act. An agreement, executed on February 8, 1962, by the Governor Bert Combs and Dr. Glenn T. Seaborg, Chairman of the Atomic Energy Commission, authorized the transfer. Kentucky thus assumed control of over 100 licensed users of radioactive materials within the

Report - State of Kentucky - 2 -

state. The licensing power is vested in the Kentucky State Department of Health in the Division of Radiological Health.

IV. Kentucky's Development Program

On March 14, 1962, the General Assembly passed a measure creating an Atomic Energy Authority to aid in the financing of nuclear and nuclear-related plants. The authority has the power to issue revenue bonds in unlimited amounts to aid in building nuclear plants.

V. Education

The Kentucky Advisory Committee on Nuclear Energy and the Office of Coordinator of Atomic Activities have engaged in a series of seminars at various universities in the state to inform Kentucky's teachers, police, firemen, sheriffs, and other public officials of the potentialities and development of the peaceful atom. A radio series produced by the Kentucky Advisory Committee on Nuclear Energy and made up of leading experts in the field of nuclear energy is presently being aired by fifteen radio stations in Kentucky. A similar television series was produced which covered one-third of the state.

VI. Research

The Kentucky Advisory Committee on Nuclear Energy and the Kentucky Department of Economic Development are sponsoring a research program at the University of Louisville to determine the feasibility of utilizing radiation in producing chemicals from coal. A thermodynamic study has been published with favorable indications. Work is now progressing toward the construction of a pilot facility. Other universities and colleges in the state are engaged in varied programs of nuclear research under contract with the Atomic Energy Commission or on their own.

Report By: Mr. J. N. Neel, Jr., Frankfort, Kentucky

For: The Hon. J.B. Breckinridge, Attorney General, State Capitol, Frankfort, Ky.

ATOMIC DEVELOPMENT IN THE STATE OF NEW YORK — Report of 1960

Twelve objectives are listed in this report, some of which are not applicable to North Carolina at the present time. These objectives were originally reported on December 1, 1959 and the 1960 report indicates the degree to which they are being fulfilled. Our primary interest in the statement of objectives is to compare them with the opportunities available in North Carolina.

Objective I: Atomic Power - Expansion of the State's atomic power capacity, including particularly the construction at the earliest practicable date of either an economically competitive full scale atomic power plant or a prototype leading directly toward the construction of an economically competitive full scale plant. This was proposed because "We believe that there is no single event that would do more to establish the peaceful atomic industry on a permanent, flourishing basis in the State of New York than the achievement of economically competitive atomic power in this area."

The objective of constructing a full-scale nuclear power plant in North Carolina does not appear appropriate at present.

Objectives II & III: Byproduct Storage - Construction of a uranium fuel recovery and reprocessing plant because the fuel reprocessing industry is not yet committed to a geographical area and because we believe New York is uniquely well situated from the standpoint of both the potential market and the state's resources to become the site of such an industry.

Objective III: Establishment of a site where radioactive byproduct and waste materials may be stored without hazard to the public health and safety because "We believe such a site to be necessary from the standpoint of the health and safety of the people of the state, and also because the existence of such a site would serve to encourage the growth of the atomic industry within the state."

This matter may warrant investigation for North Carolina but unless our geographical location between Norfolk, Virginia and the Savannah River plant in South Carolina would have some distinctive advantage, it hardly appears that Objective III would be appropriate at this time. We should actively investigate a reprocessing plant which AEC is considering and I will obtain information while in Washington, March 20th.

Objective IV: - Test Reactor - Construction of a high powered nuclear test reactor because "No such reactor exists in the northeast, because most of the potential users of such a reactor are located in the northeast, and because such a reactor would tend to stimulate atomic industrial development in the state."

It would appear that our most logical need for additional test reactors would be in connection with educational facilities. We will look to the members of the Committee associated with such facilities to define a specific target in this regard.

Objectives V & VI: Port Facilities - Establishment of at least one shipyard as a center for the construction of nuclear ships because "nuclear shipbuilding is a large, growing industry, and because New York, although a leading maritime state, is at present not engaged in this type of activity."

It would not appear logical for any government funds to be made available to North Carolina for the construction of such port facilities in view of Norfolk, Virginia and Charleston, South Carolina. Notwithstanding, this matter should be brought to the attention of the State Port Authorities for the definition of a longrun goal in this connection.

Objective VII: Fuel Fabrication - Expansion of the state's volume of fuel fabrication work, including particularly the entry of the state's industry into the business of fabricating nuclear fuel for ship propulsion because "New York is well situated with regard to the nuclear fuel market, and because the state is at present not engaged, outside of federally owned laboratories, in the fabrication of nuclear fuel for ship propulsion."

This objective would not appear appropriate to the State of North Carolina at present but any view to the contrary will be welcomed.

Objective VIII: Process Heat Reactor - Construction of a process heat reactor for industrial utilization because "Demonstration of the feasibility of producing usable industrial heat from atomic energy would stimulate atomic development within the state and at the same time benefit such other of the state's major activities as the chemical and paper industries."

It would appear that our continuing nuclear research in North Carolina colleges and universities to improve the efficiency of such reactors may be more important than proposing to build a commercial reactor at this time. Contrary views are invited.

Objective IX: Regulatory Agreement - Execution of an agreement with the Atomic Energy Commission providing for the assumption by the state of regulatory authority over radioisotopes and such other nuclear materials as may be possible under federal law because "A law authorizing such an agreement was enacted in the last session of Congress, and because we believe that both the public health and safety and the atomic industry will benefit if states play an increasingly larger role in the regulation of atomic activities."

This objective deserves our thorough investigation.

Objective X: Research and Training - Strengthening, on a state-wide basis, of the atomic research and training facilities of the state's higher educational system because "Maintenance of a scientific educational environment of high quality is necessary to the growth of an atomic industry within the state."

This objective should rate high if not foremost as our present objectives in North Carolina.

Objective XI: Radioisotopes - Expansion of the industrial use of radioactive materials and of research directed toward discovering new productive uses for such materials because "We believe that more industries within the state could productively employ radioactive materials than are currently doing so, and because such materials have an enormous potential for industrial utilization that has not as yet been realized, to the detriment of the economics of the entire atomic industry."

This is certainly a worthy objective for North Carolina and should receive our specific recommendations to the Governor in the near future.

Objective XII: Radiation Accidents - Establishment of training programs and identification of personnel and equipment useful in handling accidents believed to involve radioactive materials because "This is in the interest of the public health and safety and also because we believe that the hazards of radioactivity may not be so great in themselves as the possibility that they may be misinterpreted and consequently not handled in the most effective possible way."

This has been done in North Carolina and should constitute a specific statement of appreciation to the Governor in the near future for his help in this direction.

In addition to these specific objectives, the matter of Transportation Regulations was considered in this report.

AN OUTLINE OF KENTUCKY'S NUCLEAR PROGRAM - 1961

I am enclosing a photostat of a reprint from Business Week in connection with this program. You will note the manner in which Kentucky has taken aim at our number one target, namely attracting new industries and increasing atomic activity within the state to bolster the economy of the state. The report states, "Since regulation and development of nuclear energy are so necessarily entwined because of the hazards associated with radiation, it is impossible to speak of one without referring to the other. Three state governmental units have been created to effect this 'healthy balance between these two aspects': The licensing power over byproduct, source, and special nuclear materials has been placed in the Division of Radiological Health in the Kentucky State Department of Health."

"The Department of Economic Development was selected as the agency to assist nuclear and nuclear-related industries in locating in Kentucky.

"The third unit is the Office of coordinator of Atomic Activities to oversee the developing nuclear energy programs of the state in order to direct and assure a healthy balance between regulation and development." Each of these units is staffed to discuss problems with industries outside the state of Kentucky in locating nuclear energy projects in Kentucky.

It may be well for us to consider the designation of similar personnel, possibly

in the State Department of Health and C & D Board, to aggressively present the favorable aspects of our state for the location of nuclear activities. This should become appropriate after we have urged the recommendation of those programs which will make the state favorable for such projects.

Kentucky has a nuclear education program to "Allay public fear and create acceptance of radiation as a powerful and constructive new tool in bettering the life of Kentuckians." A teachers' seminar, entitled "Living with Radiation" and sponsored by the Kentucky Advisory Committee on Nuclear Energy, was held in 1961. A one-day "Press Seminar" was held for the news media of the state; i.e., editors, publishers, reporters, television and radio, for the purpose of acquainting the news media with Kentucky's atomic energy program and with basic radiation facts and a Kentucky Atomic Energy Institute for firemen, police and peace officers to acquaint these groups with the facts of basic radiation safety. Also, a weekly radio series participated in by all fifty radio stations in Kentucky was presented to the people of Kentucky concerning nuclear energy.

A Research and Development Program was established to "ascertain the feasibility of utilizing high energy radiation as a means of accelerating rates of coal reactions for the purpose of producing acids from coal." Also, the Kentucky Spindletop Research Center and Park is available for the location of nuclear research laboratories for the purpose of performing specialized industrial research. It is devoted entirely to the full range of industrial research as a three-way partnership involving the University of Kentucky, the State Government, and private industry.

Kentucky was the first state in the 17-state southern region to ratify the Southern Interstate Nuclear Compact.

Kentucky has also created a special Task Force of experts to look into the establishment of a radioactive waste material site in the state, in the belief that nuclear industry will be attracted by the availability of a secure and convenient site for the disposal of nuclear wastes.

They also claim "More industrial financing plans (5) than any other state, sufficient power capacity from public and private sources to supply the needs of any new expanding industry, adequate ground and surface water to fulfill present and future needs, high labor productivity, the third largest bituminous coal-producing state, more than 90 of Kentucky's 120 counties have natural gas, raw materials available are coal, natural gas, oil, limestone, silica sand, fluorspar, ball and fire clay, timber.

THE FLORIDA NUCLEAR PROGRAM - 1955 to 1961

Enclosed is a sheet describing "Typical Considerations Which the Florida Nuclear Commission Attempts to Monitor, Evaluate and Factor into a Comprehensive Nuclear Program."

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Florida claims a range and quality of nuclear education and research in its University system which is rivaled by few states. Florida State Universities have obtained 9.2 million dollars from non-state sources for atomic research in the past six years. Florida's universities rank fourth in the nation in the total use of radio-isotopes for teaching and research. The U. S. Atomic Energy Commission made a 3 million dollar grant to Florida for an "Institute of Molecular Biophysics" at Florida State University.

On the commercial front, an estimated annual saving of 10 million dollars has been effected for the Florida cattle industry by the world's first successful full-scale radiation screwworm eradication program carried out by the Florida Livestock Board in conjunction with the United States Department of Agriculture.

The U. S. Atomic Energy Commission currently has 71.8 million dollars investment in Florida's atomic energy facilities.

A number of new atomic industries have been located in Florida during the past six years including the General Electric facility in Pinellas County representing a plant investment of 11.7 million dollars with nearly 1500 employees and an annual payroll approximating 8 million dollars. Two other instances were cited, the General Nuclear Engineering of Dunedin employing 100 highly-skilled scientists and engineers with an estimated annual payroll of 1 million dollars and a recently-developed mining industry centered on heavy mineral resources such as zirconium, hafnium, thorium, and uranium oxide, representing a capital investment of some 40 million dollars and establishing Florida as a leader in the primary production of nuclear-age metals.

Since 1957 the number of licensed Florida users of radioactive byproducts (primarily radioisotopes) has increased over 400 per cent -- from 41 to 170. This ranks Florida first in the southeast and sixth in the nation, so it is claimed.

The Nuclear Commission has aided in the adjustment of Florida's legal and administrative framework to the inevitable impact of atomic energy. Key state agencies such as the State Board of Health, Florida Industrial Commission, Florida Development Commission, Department of Public Safety, Department of Water Resources, Railroad and Public Utilities Commission and Air Pollution Control Commission have created programs to co-operate with the special requirements of public health and for accelerating peace-time uses of atomic energy.

The Nuclear Commission has carried out its functions primarily through three working committees: Committee on Radiological Safety, State Committee on Science and Mathematics, and the Public Information Committee. These Committees have worked with private industry, schools, governmental agencies, and the public. Numerous publications were prepared and distributed.

The Florida Nuclear Development Commission (which is composed of nine people) has promoted state-wide co-ordination, Inter-Agency assistance, and education and industrial promotion to best summarize its work since December 1955

when it was created. "No new, expensive bureaucracy has been built on the atom in Florida." Approximately 10 million dollars in direct state funds have been secured for organizing and supporting a balanced nuclear program including education, public health, safety, and atomic industrial and agricultural development. Prime assistance has also been given in acquiring substantial non-state funds, equipment, and materials for the conduct of nuclear activities by state agencies and institutions.

Three standing committees of the Nuclear Commission have worked diligently to establish a sound structure for atomic growth:

1. Committee on Radiological Safety.
2. State Committee on Science and Mathematics which conducted extensive studies relating to the quality of science and mathematics instruction in the public schools for training future nuclear scientists and engineers.
3. The Public Information Committee which has endeavored to foster public understanding of atomic energy and to keep public officials and the press informed as to problems and progress in the field.

Special seminars and workshops have been conducted by the Nuclear Commission. Extensive work has been invested in implementation of Public Law 86-373 which provides for transfer to the state of control over certain nuclear materials which are presently under the authority of the AEC.

In 1957 Florida Legislature appropriated \$88,500 for nuclear industrial development to be administered by the Florida Development Commission. The primary purpose of this appropriation was to provide a comprehensive survey of the present extent and future potential of nuclear development in Florida.

This survey was completed in March, 1958, by the management consultant firm of Booz, Allen and Hamilton of New York City. It forecast a possible industrial sales volume of 220 Million dollars per year by 1968 for Florida.

The Florida Development Commission has placed the industrial development phase of the program directly under the supervision of the Assistant Executive Director of the Florida Development Commission. One Industrial Specialist has been assigned to nuclear industry development work.

"Major attention was given to providing detailed site data to companies and groups of companies interested in establishing a multimillion dollar commercial test reactor. The reactor, if constructed, would serve to attract subsidiary scientific research facilities to its vicinity. Competition from other states for this project is extremely intense, but from all indications, Florida continues to have at least a reasonable probability of obtaining the facility."

Effort is being made to attract a gamma process development irradiator to Florida. The facility is expected to cost about \$1,600,000 and is to be used in

developing manufacturing processes which take advantage of beneficial alterations produced in matter by intense gamma irradiation.

In December, 1958, the Development Commission co-sponsored with the Nuclear Commission the "Florida Workshop on Industrial Radioisotopes". The purpose of the meeting was to introduce Florida industrialists to the time and dollar savings which have been achieved elsewhere in the nation through the industrial application of radioisotopes.

The Development Commission has sponsored a Florida booth at the annual national Atom Fair, which is the principal trade show in the nuclear industry.

The Development Commission concentrates its nuclear activities on contacts with industry to achieve Governor Collins' forecast of the Atom as the tool which will fashion the "economic emancipation of the South".

From the standpoint of the State Board of Health, background radiation monitoring has become a public health requirement, a new Division of Radiological and Occupational Health has been established and about 25% of dental and medical X-ray equipment in Florida has been examined by the State Board of Health for its safe operation.

In co-operation with the U. S. Public Health Service, regular checks are also being made for the Strontium-90 content of Florida-produced milk.

During the past six years with the assistance of the Florida Nuclear Commission, the following Florida State Agencies have planned for efficient and effective administration of nuclear responsibilities:

- State Development Commission
- State Industrial Commission
- State Livestock Board
- State Board of Control (the leading Florida universities)
- State Board of Health
- State Treasurer's Office (Department of Insurance)
- Department of Water Resources
- Department of Agriculture (Food and Drug Administration)
- Air Pollution Control Commission
- Civil Defense Council
- Department of Public Safety
- Railroad & Public Utilities Commission.

The Florida Commission defines two advantages to the State if their efforts are successful:

(1) There would be an increase in the economy of the state resulting from the application of nuclear science to new industries, processes, products, agriculture, medicine and services.

(2) Benefits to the state would not be confined solely to nuclear industries or activities. Equally important, the development of nuclear leadership would create a psychological climate of an enlightened and dynamic state; a state alert and inviting to all industry and attractive to industrial and governmental research laboratories and installations.

We can see from these three reports that substantial activity is being undertaken in other states. I will try to obtain more information at the SINB Meeting on April 10 and 11th just prior to our meeting on additional states which have well planned programs. I am supposed to make a two to five minute statement of our State Program at that meeting and would appreciate any comments or recommendations you may have.

Agnew H. Bahnson, Jr/s

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Dr. Louis A. Pardue

EDUCATION REPORT

Nuclear energy continues to hold an important place in education and to receive increasing attention although another important and glamorous scientific field has also moved to center stage to share in the emphasis and the spotlight. Even though the relevance may not be sufficient, it is interesting and maybe partially worthwhile to comment briefly on these two areas of scientific effort which dominate scientific interest and education in these times. Nuclear energy in a manner of speaking is a product of this century, much of it coming in the last 25 years for it is an exploitation of scientific principles which were discovered in these recent years. Space science on the other hand is basically much older resting in large part on the long known principles of classical astronomy. Space engineering could have been exploited a long time ago if "Big Science" had been invented much earlier. Nuclear engineering followed right along in the warm tracks of nuclear science thanks to the availability of "Big Science".

Since the Board is interested primarily in the peaceful implications and uses of nuclear science and engineering it would seem that a counterpart might not come into existence in the other area for there the peaceful implications are presently rather limited to such possibilities as communications and weather forecasting. Many knowledgeable and thoughtful persons even after they have allowed for the peaceful and military uses of missiles seriously question the worthwhileness of much of the race into space. Is there justification for putting a man on the moon?

Nuclear energy on the other hand deals entirely with one of man's most important concerns in peace or war - the means by which his work is done, one with more than usual amount of danger. It is something for everyone to think about and work with. It impinges upon every facet of our culture and must be fitted into our pattern or be

- 2 -

an agent in changing it. It is the purpose of this Board to provide helpful guidance in this important matter. Education as always occupies a central role in such a development. The evolution of the science and accompanying technology must be fostered by study and research and the many implications for social, economic and political organization and activity must be thought through rationally and effectively implemented.

Examples are numerous in all sections of the country and throughout the Southern region which is of special interest to this body. Of particular significance is the cooperative program of more than 30 universities at the Oak Ridge Institute of Nuclear Studies and the cooperative training program at the Savannah River plant of the Atomic Energy Commission. The individual institutions are conducting on-campus programs of training and research on their own and under the sponsorship of the Atomic Energy Commission. The programs in Virginia at VPI and the State University are possibly representative of these. Both institutions have reactors, a large pool type one at Charlottesville and a smaller training reactor at Blacksburg. These instruments are used in a variety of training and research work e.g. the Nuclear Science and Engineering graduate program at VPI. We could go on in Virginia and elsewhere.

Examples are available of training programs for health and police officers for readiness in dealing with situations involving radioactive effects and of efforts to interest secondary school students to think about work and careers in the atomic energy field.

Indeed much can be said on the positive side, but the story cannot end there. The effort must go on at an increasing rate wherever possible so that our competence at all levels will be as nearly adequate as possible for any opportunity or alas emergency. The work of this Board can be most helpful.

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POWER REPORT

Report on Electric Power Reactor Projects

The major nuclear power plant projects scheduled for completion in 1961 were delayed due to construction or technical difficulties. The reactors involved were the Elk River, Minnesota, 22,000 kilowatt boiling water reactor; Consolidated Edison's Indian Point, New York, pressurized water 255,000 kilowatt plant (with oil-fired superheater); the Enrico Fermi fast breeder 60,900 kilowatt project near Detroit; and the Piqua, Ohio, organic cooled and moderated 10,400 kilowatt plant. These plants together with others going forward on schedule are expected to go critical in 1962 adding some 450,000 kilowatts of new nuclear generating capacity.

The 50,000 kilowatt boiling water project proposed by the cities of Los Angeles and Pasadena was cancelled due to site difficulty but the same project may be sponsored by the Dairyland Power Cooperative for location in Wisconsin. Los Angeles and Pasadena are now looking at two possible locations for an underground plant site in Southern California hoping to secure federal aid under the Civilian Defense program for a 300,000 to 400,000 kilowatt plant to be completed in 1968 or 1969.

Plans for construction of the 50,000 kilowatt Florida West Coast Nuclear Group (FWCNG) project were terminated by the AEC in May due to economic and technical uncertainties. Further research on this reactor type, however, will be continued by the East Central Nuclear Group which had participated in the research and development work on the project.

The Florida West Coast Nuclear Group, consisting of Tampa Electric Company and Florida Power Corporation, has been enlarged by the addition of Florida Power & Light Company and will continue as a study and research group.

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POWER REPORT

- 2 -

AEC abandoned its proposed prototype organic-cooled reactor of 50,000 kilowatt capacity because of inability to secure any utility sponsorship.

AEC is studying plans for legislation permitting private ownership of reactor in the future to eliminate the inventory problem arising from large amounts of reactor fuel out on lease. Since the feasibility of current reactor projects was based on present lease arrangements, it seems probable that any basic change in policy will be a gradual one worked out over a transition period of some years.

AEC is not budgeting any funds for new civilian reactor power projects but Pacific Gas and Electric Company and Southern California Edison Company have scheduled very large reactor projects for completion in 1965. While some optimistic experts predict that nuclear power will be competitive in a few high cost areas by 1968, most authorities expect that the development will be gradual and agree with Philip Sporn's statement of January 29 before the American Institute of Electrical Engineers where he said "Nuclear fuel's importance will pick up acceleration of stature starting with the period roughly of 1975-1980 and will become truly significant in the last two decades of this century."

The attached tabulation lists projects built, building, and planned together with the names of study, research and development groups and Southern utilities who are participating in the project groups.

Mr. George Kinsman, Vice President
Florida Power and Light Company
Post Office Box 3100
Miami 1, Florida

ELECTRIC POWER REACTOR PROJECTS

<u>Project</u>	<u>Location</u>	<u>Type</u>	<u>Power Level (Net Electrical Kilowatts)</u>	<u>Completion or Scheduled Completion Date</u>
<u>BUILT</u>				
1. Commonwealth Edison Company (Nuclear Power Group Project)	Dresden, Ill.	Boiling water	180,000	1959
2. Yankee Atomic Electric Company (Group Project)	Rowe, Mass.	Pressurized water	150,000	1960
3. AEC; Duquesne Light Co. (PWR)	Shippingport, Pennsylvania	Pressurized water	60,000	1957
4. AEC; Atomics International (SRE)	Santa Susana, California	Sodium-graphite	6,000	1957
5. AEC; Argonne National Lab. (EBWR)	Argonne, Ill.	Boiling water	5,000	1956
6. General Electric Company (VBWR)	Vallecitos, California	Boiling water	5,000	1957
<u>BUILDING</u>				
7. Consolidated Edison Company	Indian Point, New York	Pressurized water (Additional	151,000 104,000 from oil-fired superheater)	1962
8. Power Reactor Development Co. (Group Project)	Lagoon Beach, Michigan	Fast breeder, sodium	60,900	1962
9. AEC; Consumers Public Power District of Nebraska (SGR)	Hallam, Neb.	Sodium-graphite	75,000	1962

Project	Location	Type	Power Level or (Net Electrical Kilowatts)	Completion or Scheduled Completion Date
10. Northern States Power Co. (Pathfinder)	Sioux Falls, S.D.	Boiling water (17,000 from nuclear superheater)	62,000	1962
11. Pacific Gas & Electric Co.	Humboldt Bay, California	Boiling water	48,500	1962
12. Consumers Power Company	Big Rock Point, Michigan	Boiling water	47,800	1962
13. AEC; TVA (EGCR)	Oak Ridge, Tenn. Gas cooled, graphite		22,300	1963
14. AEC; Rural Cooperative Power Association	Elk River, Minn. Boiling water (4,200 from coal-fired superheater)		22,000	1962
15. AEC; Argonne National Laboratory (EBR-2)	NRTS, Idaho	Fast breeder, sodium	16,500	1962
16. Carolinas Virginia Nuclear Associates (Group Project)	Parr Shoals, S.C. Pressurized heavy water		17,000	1962
17. AEC and Puerto Rico Water Authority (BONUS)	Rincon, P. R.	Boiling integral superheat	16,300	1962
18. AEC; City of Piqua	Piqua, Ohio	Organic (terphenyl) moderated & cooled	11,400	1962
19. Saxton Nuclear Experimental Corp. (Group Project)	Saxton, Penn.	Pressurized water	5,000	1962
20. Philadelphia Electric Co. (Group Project)	Peach Bottom, Pennsylvania	Gas cooled, graphite	40,000	1962-63

Completion
or
Scheduled
Completion
Date

Power Level
(Net
Electrical
Kilowatts)

Type

Location

Project

PLANNED

21. Southern California Edison; San Diego Gas & Elec. Co.	Sou. California	Pressurized water	355,000	1965
22. Pacific Gas & Electric Co.	Bodega Bay, California	Boiling water	313,000	1965
23. AEC; Dairyland Power Cooperative (ICBW)	Genoa, Wis.	Boiling water	50,000	1965

STUDY, RESEARCH AND DEVELOPMENT GROUPS

24. Empire State Atomic Development Associates, Inc.

25. Texas Atomic Energy Research Foundation

26. Southwest Atomic Energy Associates

27. Atomic Power Development Associates

28. East Central Nuclear Group

29. Florida West Coast Nuclear Group

30. Rocky Mountain-Pacific Nuclear Research Group

SOUTHERN UTILITIES IN ABOVE GROUPS

Utility

Alabama Power Company
Appalachian Power Company

Groups
8, 20, 27
28

Utility

Arkansas-Missouri Power Company
 Arkansas Power & Light Company
 Baltimore Gas & Electric Company
 Carolina Power & Light Company
 Central Louisiana Electric Co., Inc.
 Central Power & Light Company
 Community Public Service Co.
 Dallas Power & Light Company
 Delaware Power & Light Company
 Duke Power Company
 El Paso Electric Company
 The Empire District Electric Co.
 Florida Power & Light Company
 Florida Power Corporation
 Georgia Power Company
 Gulf Power Company
 Gulf States Utilities Co.
 Houston Lighting & Power Company
 Kansas City Power & Light Company
 Kentucky Utilities Company
 Louisiana Power & Light Company
 Louisville Gas & Electric Company
 Mississippi Power & Light Company
 Missouri Public Service Company
 New Orleans Public Service Co.
 Oklahoma Gas and Electric Inc.
 Oklahoma Gas and Electric Co.
 Potomac Edison Company
 Potomac Electric Power Co.
 Public Service Company of Oklahoma
 St. Joseph Light & Power Company
 South Carolina Electric & Gas Co.
 Southwestern Electric Power Company
 Southwestern Public Service Company
 Tampa Electric Company

Groups

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Utility

Tennessee Valley Authority
Texas Electric Service Co.
Texas Power & Light Company
Union Electric Company
Virginia Electric & Power Company
West Texas Utilities Company

COPY

Group

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PUBLIC HEALTH REPORT

The public health specialist is interested in impact of environmental changes on aggregations of individuals in his community. Certainly, nuclear energy has induced environmental change that the public health specialist has sought to understand, measure, and evaluate. It is natural that his first interest would be in the harmful effects of ionizing radiation on humans in his community and what methods could be used to strike a balance between biological risk and benefits to be derived from radiation use. Public health departments, particularly the U. S. Public Health Service, have been active in the field of measuring radiation levels in food, water, and the atmosphere.

The Iodine ¹³¹, Strontium ⁸⁹, and Strontium ⁹⁰, in milk has been determined on milk shed samples as well as the consumer samples in various cities and states across the country. Certainly the importance of milk in the American diet has been demonstrated in highest circles in the land, even to the President's table. Selected daily diets from institutions feeding children of various ages have been analyzed for total radioactivity over a long period of time. Water samples both in streams and precipitation have been analyzed by the National Radiation Surveillance Network. The same group has monitored the atmosphere for evidence of fission products. Admittedly, these measurements have been related to the atmospheric testing of atomic war heads, but the techniques and methods will be applicable to contamination of the same environment with radioactivity from peaceful uses of atomic energy as well as establishment of baselines of background activity.

In the past most Governmental bodies have depended upon unofficial bodies such as the International Commission of Radiological Protection (ICRP) and the National

- 2 -

Committee on Radiation Protection and Measurements for recommendations on radiation protection. In 1959 under Public Law 86-373, the Federal Radiation Council was formed to provide an official Federal policy on human radiation exposures. It is reasonable to assume that this Federal policy will be adopted by State radiological health agencies. This Council has now issued two staff reports, May 1960 and September 1961, on Background Material for the Development of Radiation Protection Standards, (May 13, 1960). Both these reports are excellent presentations of the problems of radiation safety as well as policy making documents in regard to the establishment of standards and should be read for amplification of my brief references to them.

The first of these FRC reports introduced and defined the term "Radiation Protection Guide" (RPG). It provided numerical values for radiation protection guides for the whole body and certain organs of radiation workers and for the whole body of individuals in the general population as well as average population gonadal dose.

The second report introduced a concept of a graded system of actions depending upon the three ranges of transient rates of daily intake of radioactive materials. This report established the three ranges for I^{131} , Radium 226 , and Strontium 89 , and Strontium 90 . Future reports will develop appropriate radiation protection guidance for those radionuclides for which useful applications of radiation or nuclear energy require release to the environment of significant amounts of these nuclides.

State Public Health Departments are still active in the assumption of regulatory and licensing activity by agreements with the Atomic Energy Commission under Public Law 86-373.

- 3 -

Apart from the regulatory activity in the radiological health field, public health is vitally interested in other aspects of nuclear medicine. The impact of radio-nuclides in curative and diagnostic medicine and medical research on many of the chronic illnesses may alter the demands of time, effort, and money in community health programs both now and in the future. The use of radioactive isotopes with its requirements for shielding and location has had its impact both on new hospitals and on additions to existing institutions constructed under the Hill-Burton program. Radioactive tracers to determine rates and patterns of stream flow both in fluids and gases have been an important addition to the program of environmental engineering in public health.

Dr. R. H. Hutcheson
Commissioner of Public Health
State of Tennessee
Nashville 3, Tennessee

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Report -- State of Arkansas

The Arkansas Nuclear Energy Committee currently consists of the following:

William P. Rock, Chairman
Dr. Alfred Kahn, Jr., Little Rock, Arkansas
Dr. H. J. Barnhard, University of Arkansas School of Medicine, Little Rock, Arkansas
Dr. J. T. Herron, Head, Arkansas Department of Health, Little Rock, Arkansas
William R. Smith, Macon Lake Gin Company, Lake Village, Arkansas
Harold Ohlendorf, Ohlendorf Farms, Osceola, Arkansas
Ralph Tallman, Lion Oil Company, El Dorado, Arkansas
H. C. Willms, Reynolds Metals Company, Jones Mill, Arkansas
Sam Harris, Arkansas Louisiana Gas Company, Little Rock, Arkansas
Dr. M. K. Testerman, Graduate Institute of Technology, Little Rock, Arkansas
Carroll Walsh, Arkansas Power & Light Company, Pine Bluff, Arkansas
Arch Ford, Arkansas Department of Education, Little Rock, Arkansas
Dr. George S. Benson, Harding College, Searcy, Arkansas
Dr. David W. Mullins, University of Arkansas, Fayetteville, Arkansas
Dr. John M. Peterson, University of Arkansas Industrial Research Center, Little Rock, Arkansas
Weems Trussell, Attorney-at-Law, Fordyce, Arkansas

This Committee is consistent with the original policy of medical, utility, agricultural, industrial and educational representation. The Committee is constantly mindful of the original purpose and policy defined after several years' work and the concluding meeting in St. Petersburg, Florida that its job is providing information to the public in 16 Southern states and education as it relates to nuclear energy developments.

In keeping with this, in the latter part of August last year (preceded by several meetings of RACNE personnel and particularly the director Robert H. Solomons, III) we held a combination Nuclear Seminar and Exhibit of Nuclear, Defense and Space material. Winthrop Rockefeller was master of ceremonies at the two-day meeting and the program was excellently received. 50,000 people attended the Exhibit of Space, Defense and Nuclear material and the dinners and luncheons featured Dr. Leland J. Haworth of the Atomic Energy Commission; Dr. Wernher von Braun, Director of the George C. Marshall Space Flight Center, National Aeronautics and Space Administration Huntsville, Alabama; and Dr. Edward L. Teller, Professor of Physics At-Large.

University of California, Berkeley, California.

This Seminar was known as the Southwest Seminar on Management and Uses of Nuclear Energy and was sponsored by the five Southwestern states of Arkansas, Louisiana, Mississippi, Oklahoma, and Texas, the Atomic Energy Commission, the Defense Department, the National Aeronautics and Space Administration, the Council of State Governments and the Regional Advisory Council on Nuclear Energy.

The Seminar-Exhibit did a great deal of good by enlightening the people and in particular, the educators and public officials. Dr. von Braun addressed the Arkansas Legislature and many of the members of the Legislature attended the Exhibit and opening reception. This all had one result in the special session of the Legislature authorizing the establishment in the Department of Health a division for nuclear energy and authorizing the Governor to make contracts with the Atomic Energy Commission for within-the-state control of nuclear products.

This Seminar-Exhibit required much work and somehow it would seem well for the Southern Interstate Nuclear Board to find ways of carrying on informative meetings and exhibits throughout the South to maintain a growth of understanding and knowledge in order to maintain the image of the South's interest and ability in the nuclear field. This latter was the whole purpose of the Southern Governors' Conference in establishing the medium of RACNE and now, of SINB.

One of the original facets of purpose of RACNE was the establishment of membership at large for the press for the purposes of information through the South. This should be done; and at one time it was recommended that we have on the Board two members at large from the press.

We all should keep consistent pressure at the development of information on the subject, otherwise we will lose the original initiative.

- 3 -

Another SINB undertaking which would certainly advance our status in the South would be to help in extending nuclear research and manufacture in the Southern states. In our Industrial Development Commission we are able to keep in reasonable touch with the companies related to nuclear manufacture but we are not in as close touch as the officers of SINB and the staff can be with the Atomic Energy Commission which certainly is a focal point for such developments.

Mr. William P. Rock, Executive Director
Arkansas Industrial Development Commission
State Capitol
Little Rock, Arkansas

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Report - State of Georgia

A continued growth in the use of radioactive materials, an increase in University Research Projects in Nuclear Energy, and a planned expansion of education in the nuclear field have been noted in Georgia over the past year.

An outstanding development which involves this organization came on March 5 when Governor Ernest Vandiver signed legislation making Georgia the ninth state to ratify the Southern Interstate Nuclear Compact. This bill was reviewed and approved last December by the Georgia Nuclear Advisory Commission.

Another piece of legislation involving radioactive materials did not fare so well, however. This measure was sponsored by the State Health Department and called for a re-codification of all department regulations which included a section on radiation protection procedures. There was no objection to this portion of the bill, but other sections ran into difficulty and the measure failed to win approval. It is generally recognized that the Georgia Health Department is highly sophisticated in matters involving radioactive materials, and it is expected that this bill will be presented to the Assembly again next year.

The surveillance of all radiation sources by the Georgia Department of Public Health and improvement of their own capabilities continues in preparation for the day when Georgia may take over regulatory authority now held by the Atomic Energy Commission for certain radioisotopes.

The use of radioactive materials by hospitals and private physicians in Georgia is still on the increase.

In another new development in the state, the AEC recently set up a compliance office in Atlanta to serve the Southern states. This office is checking users of nuclear byproducts, source materials, and special nuclear materials and examining

Report - State of Georgia

- 2 -

sites where these materials will be used to assure compliance with AEC regulations. The office will employ a reactor engineer to check nuclear reactors in its area. This work is currently being handled by the Washington office.

The Price Gilbert Memorial Library at the Georgia Institute of Technology, already one of 85 depositories for AEC documents in the United States, is setting up a unique depository for Swedish nuclear documents. The library expects soon to be connected with 12 other libraries in the nation and with the Department of Commerce through a teletype network and it is anticipated that nuclear information will be rapidly exchanged by means of this system. The library contains over 244,065 bound volumes and nearly 110,011 technical reports. The emphasis is on technical literature, and the collection is exceptionally complete and convenient for research in engineering, the physical sciences, and related subjects. Approximately 7,409 serial publications, including an excellent selection of the most outstanding foreign journals are now being received. In addition to the AEC, the library serves as a depository for the Rand Corp., the National Aeronautics and Space Administration, and the United States Patents Office.

On the industrial front, the Southern Co., of which the Georgia Power Company, is a member, is participating in the Enrico Fermi Reactor Project near Detroit. Lockheed Aircraft Corp. recently re-submitted its licenses for a one megawatt thermal unit and an 80 watt critical experimental facility at Dawsonville which have been leased from the Air Force. Some Lockheed projects include radiation shielding for tanks, reliability tests for the Polaris Missile, and construction of a reactor for Purdue University. Other industrial users of radioisotopes in Georgia include the E.V. Camp Steelworks, the Union Bag-Camp Paper Co., Law Engineering Testing Co., and Glover Machine Works.

Report - State of Georgia

- 3 -

Georgia's port city of Savannah recently became one of two ports in the nation to be cleared for importation of irradiated fuel elements from overseas after citizens of the area approved the action. The revolutionary nuclear-powered merchant ship, N. S. Savannah, is expected to make the namesake city one of its first ports-of-call and possibly establish its home base there.

A great deal of activity in nuclear research is presently underway at the Georgia Institute of Technology, the University of Georgia, and Emory University. Some of Emory's research includes work in radiation recovery and cell metabolism, the behavior of cell mechanisms during and following gamma irradiation, the effects of radiation on plant and animal communities in northern Georgia, and the evaluation of liver functions with radioactive compounds. Emory has the nation's only campus-controlled radiation field.

Studies in life sciences, evaluation of radiation effects on the anatomy of living trees, and the role of mineral elements in poultry nutrition are being conducted at the University of Georgia.

Nuclear energy and radiation research projects underway at the Georgia Institute of Technology encompass funds amounting to over \$1.2 million. These studies are being conducted largely for the U. S. Atomic Energy Commission, other federal agencies, departments of the State of Georgia, and private industry. Some of the projects include the use of radioisotopes in the study of modifications of platinum catalysts, development of separation procedures for radioactive materials, radiation chemistry of organic systems, stability of quartz crystals for space satellites, and study of the ionization and charge transfer cross-sections.

In the field of nuclear education, Georgia Tech has for the past five years offered a masters degree in nuclear engineering. On July 1 of this year, Tech will

Report - State of Georgia

- 4 -

take two major steps forward into the atomic age. On that date Tech will officially inaugurate a school of nuclear engineering to provide the administrative needs of nuclear engineering students. This school will continue to offer the masters degree in nuclear engineering, and, according to Dr. William B. Harrison, who will head the school, the Ph. D. will be added as quickly as possible.

On the same date, Tech will establish a Nuclear Energy Research Division which Harrison will also head. At present, this unit is known as the reactor project.

The most significant addition to Tech's and Georgia's nuclear education and research program will come early next year when the Nuclear Research Reactor Center begins operation. Not only will this \$4.5 million facility be used in training nuclear engineering students, but it will open many avenues for these studies by advanced students in other fields. Moreover, it will provide a nuclear energy source for countless governmental and industrial research projects, and for numerous biomedical research programs to aid man in his fight against disease.

Excellent capabilities of other reactor facilities in the region are recognized by Georgia Tech. The Tech reactor, however, will provide a higher neutron flux for special nuclear research. This reactor increases the regional capabilities in the field of nuclear energy and Georgia Tech looks forward to cooperating with other facilities in the area.

Report By: Mr. Frank C. Bigger
Georgia Institute of Technology
Atlanta, Georgia

For: Mr. Frank H. Neely

Report - State of Maryland

Maryland does not have a "program" for promoting the peaceful application of nuclear energy. I think it is the consensus of our Governor's Advisory Committee on Nuclear Energy that the civilian use of nuclear energy must come about as a consequence of economic justification, and that the suppliers of radiation equipment and nuclear power plants can be expected to promote this technology when and wherever it has economic justification. So far as the supporting activities are concerned-- such as reactor and core manufacture, fuel reprocessing, waste disposal, etc. -- we regard these as essentially no different than other industrial operations, with the job of attracting them to the State falling within the province of the existing State and local industrial development agencies.

This is not to say that we have ignored or neglected the subject of civilian nuclear energy. For instance:

1. Shortly after the passage of the Atomic Energy Act of 1954 a seminar for top business executives was held in Baltimore on the industrial implications of nuclear energy.

2. In 1955 The Baltimore Applied Nucleonics Society was founded to serve as a means of education and exchange of information for present or potential workers in this field.

3. In 1958 a state law was enacted to give research reactors, particle accelerators, radiation sources, and special nuclear material the same preferential tax treatment that applies to manufacturers' machinery.

4. In 1958 a two-day seminar was held in cooperation with the AEC's Division of Isotope Development on the industrial use of radioisotopes. This was one of the first of several such seminars to be held throughout the Country.

Report - State of Maryland - 2 -

5. During 1957 and 1958 a committee of industrial and scientific executives conducted an intensive study of the desirability of establishing a research or test reactor in the Baltimore area. It was with some regret that we concluded that there was insufficient need for such facility to justify its establishment with private capital. However, the recent announcement that the Westinghouse test reactor is to be closed down because of lack of business suggests that we were well advised not to go ahead with this project.

6. Maryland has given full and timely financial support to RACNE from its inception until its replacement by SINB.

7. In 1959 the Governor appointed an Advisory Committee on Nuclear Energy which maintains surveillance over atomic energy developments within the State and advises the state government on this subject.

8. In 1960 a state law was enacted vesting control over ionizing radiation in the Maryland State Board of Health and establishing a Radiation Control Advisory Board. The State Department of Health has implemented this assignment by organizing and training a radiation protection staff. At a recent session of the legislature, the Governor was authorized to enter into agreement with the Atomic Energy Commission for assumption of regulation of the use of radioisotopes under Public Law 86-373.

In an effort to provide some measure of our nuclear "progressiveness" or development I can cite the following:

1. Although there are no nuclear central station power plants operating, building or planned in Maryland, one of our principal utilities has participated since 1954 in three of the study and development projects sponsored by investor-owned utility companies.

Report - State of Maryland

- 3 -

2. Although not actually in Maryland, the High Temperature Gas-Cooled Reactor at Peach Bottom, Pennsylvania is less than five miles from the Maryland line and closer to concentrations of population in Maryland than in Pennsylvania. Moreover it is on the reservoir that shortly will constitute Baltimore's principal water supply. Because of its proximity to these sensitive Maryland interests, this nuclear plant has been given a great deal of attention by Maryland authorities, who, however, have interposed no obstacle in the way of its construction. I mention this as an example of the attitude of Maryland citizenry and government with respect to a concrete case of close-to-home, large-scale application of nuclear energy.

3. Our state university offers a program in nuclear engineering and operates a research reactor.

4. There are two research reactors and three critical facilities in the state, with four more research reactors under construction or planned.

5. One of our industrial firms has found the Maryland situation conducive to the growth of their nuclear division to a rather substantial operation providing employment for approximately 400 people, and involving the operation of critical and gamma irradiation facilities, radioisotope processing laboratories, and reactor assembly and fuel element fabrication.

Mr. Henry T. Douglas
Reactor Systems Sales Manager
Nuclear Division
Martin-Marietta Corporation
Baltimore 3, Maryland

Report - State of Mississippi

- (1) Prior to the first day of May, 1962, the State of Mississippi will assume control from the United States Atomic Energy Commission for subcritical masses of special material, for various byproduct materials, and will also establish a procedure for controlling natural radioactivities other than critical masses of special material, and will also establish a program for controlling machine sources of ionizing radiation. This program will be under the direction of A. L. Gray, M.D., Executive Officer of the State Board of Health, and the immediate program will be supervised by Mr. Robert Rester, Dr. Gray's health physicist.
- (2) A bill has been introduced in the Mississippi House of Representatives of the State Legislature by Mr. George Payne Cossar and others to bring the State of Mississippi into the Southern Interstate Nuclear Compact and transfer from the Regional Advisory Council on Nuclear Energy. This bill is sponsored by a number of prominent House members and no opposition is anticipated. We have also received assurances from the Honorable George Yarbrough, State Senator and President Pro Tem of the State Senate, that he will sponsor the bill in the Senate.
- (3) The United States Atomic Energy Commission has expressed continued interest in the salt domes of the State of Mississippi as a suitable location for conducting subterranean detonations. This program is presently being carried on on a minimal basis due to more pressing requirements in the field of developing nuclear explosives for both peaceful and military purposes, but the project has not been terminated.

- 2 -

- (4) There is continued strong interest in the use of nuclear explosives to form the divide cut between the Tennessee and the Tombigbee Rivers. The three states of Alabama, Mississippi and Tennessee are working closely with the Tennessee-Tombigbee Waterway Development Authority to include this project as a phase of the overall development of the waterway.
- (5) Programs in nuclear engineering have been established at Mississippi State University and the University of Mississippi, and various subcritical assemblies have been secured for these institutions and are now being used for instructional purposes. The faculty of the Medical School of the University of Mississippi has also secured several contracts with the United States Atomic Energy Commission.

Dr. Andrew D. Suttle, Jr., Director
Mississippi Industrial and Technological Research Commission
Post Office Box 1037
Jackson 5, Mississippi

Report - State of North Carolina

As you know, Mr. W. D. Carmichael, Jr., former chairman of the North Carolina Atomic Energy Advisory Committee died last year and I was appointed the new chairman. I was out of the country most of last fall and we have only had one formal meeting of the entire committee since I assumed this chairmanship. Therefore, although North Carolina is well along in many atomic energy endeavors, we are still in our infancy as far as formally co-ordinating those endeavors into a well established plan. Therefore, we are anxious to learn as much as possible from other states regarding their nuclear programs rather than recount at this time our accomplishments to date.

The North Carolina Atomic Energy Advisory Committee was set up by a legislative act under Chapter 481 of the General Sessions Laws of 1959. Six Sub-Committees were specified which related to Agriculture, Education, and Research, Industry and Labor, Medicine and Public Health, Power, and Radiation Standards. There are a total of 35 people on the general committee. A budget has recently been approved for the operation of this group. A Steering Committee of 12 people has been set up to provide a more workable organization. We would appreciate hearing from other states the advantages and disadvantages they have demonstrated of having one person primarily concerned with the nuclear energy aspects of economic expansion, the maintenance of public health and safety, and a greater public awareness and knowledge of how nuclear energy can benefit not only our state but mankind as well.

At the time our Committee was set up, North Carolina had already made notable progress in several atomic energy developments, including the first nuclear reactor established on a University campus which is located at North Carolina State College in Raleigh, the irradiation of peanuts by atomic energy, and rapid progress to safe-guard public health and safety. North Carolina has a well functioning system for handling nuclear accidents. It is apparent, however, that several of the Southern states have moved further in their co-ordination of atomic energy activities in one way or another than has North Carolina to date. It is our desire to learn

from the efforts of others in order to expedite our development in this direction. We are particularly interested in the organizational set up and procedures which have been used by others and we are anxious to investigate their programs of public education and possibly to adopt some of the educational material developed, for publicity in North Carolina, if other states should feel free to share it with us. We hope that some of our present activities, though they lack formal co-ordination, may be of reciprocal value to other states.

We consider our broad parameters of interest to be economic expansion in industry, agriculture, educational facilities and research; activities to insure public health and safety; programs for training personnel in atomic energy matters, atomic energy programs in the schools, a program for broad public education; and the co-ordination of regulations both intrastate and interstate.

At present the work, which was interrupted by the death of Mr. Carmichael, is being continued to tabulate the following:

1. Source of atomic energy activity in industry, medicine, and agriculture.
2. Research projects presently in operation and those being actively planned for the future.
3. Statutory regulations pertaining to atomic energy both intra and interstate.
4. The resources and environment in North Carolina which do or can be made to afford a desirable climate for atomic energy activities.
5. The existing education and training facilities available for atomic energy endeavors.
6. Publicity outlets available for public education on atomic energy.

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I regret very much that I will not be present to read this short statement but we are holding our second formal meeting of the North Carolina Committee at the Parr, South Carolina reactor today, April 12th. All of us in North Carolina will greatly appreciate any suggestions and information from the other Southern states who have advanced beyond our present stage of planning that may enable us to move on a more solid footing as one of a group of the seventeen Southern states interested in establishing this region as a most important one for atomic energy activities.

Mr. Agnew H. Bahnson, Jr., President
The Bahnson Company
Post Office Box 367
Winston-Salem, North Carolina

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The Tennessee Advisory Committee on Atomic Energy was formed about five years ago for the purpose of providing counsel for the proper development of atomic energy in Tennessee. Because of the diversification of the nuclear field, the membership of the Committee was made very broad in order to cover the wide range of interests involved. The present Committee consists of the following persons:

Mr. Victor S. Johnson, President, Aladdin Industries, Inc. (Chairman)

Mr. Paul R. Christopher, Director, Region VIII AFL-CIO

Mr. James A. Lane, Director's Staff, Oak Ridge National Laboratory

Dr. N. R. DiLuzio, Professor of Physiology, University of Tennessee,
College of Medicine, Memphis

Dr. Edward McCrady, Vice Chancellor, University of the South, Sewanee

Dr. Webster Pendergrass, Dean, College of Agriculture, University of
Tennessee, Knoxville

Honorable Harlan A. Mathews, Commissioner, Department of Finance and
Administration

Dr. R. H. Hutcheson, Commissioner, Department of Public Health

Mr. W. Cecil Bauer, Vice President and General Manager, Southern Bell
Telephone

Mr. Nolen Puckett, Secretary of the Committee

Interest in the development of nuclear energy as an alternative source of power for the state is very slight for two reasons. First of all, 90 percent of the power used is produced by the Tennessee Valley Authority at costs less than 4 mills/kwhr; therefore, there is no immediate economic incentive for nuclear power development. Secondly, Tennessee's reserves of low-cost coal amount to some 25 billion tons and are sufficient to last at least 100 years, thus there is little likelihood that the economic situation will change in the foreseeable future. As a result of this favorable fossil fueled power outlook, activities of the Committee have been devoted to two aspects of atomic energy - namely, the legal control of the use of radioactive materials and the training of state personnel to handle emergency situations involving radiation.

The first step toward legal control of the use of radioactive materials in the state involved a series of studies by the School of Law of Vanderbilt University of the adequacy of existing legal powers to deal with problems relating to radioactive materials. Thus far, the legal powers of the Public Service Commission, the Department of Public Health, the Department of Agriculture, the Commissioner of Education, the Department of Conservation and Commerce, and the Department of Insurance have been examined in detail and recommendations made for appropriate legislative action where necessary. In addition, the adequacy of the Workmen's Compensation Act to meet problems of radiation injury has been investigated. As a result of the findings of these studies, a number of bills have been enacted. Among other things, these bills authorize the governor to enter into an agreement with the Atomic Energy Commission relating to the regulation of radioactive materials and give the Commissioner of Public Health authority to regulate the use of these materials.

In regard to the training of state personnel, a number of training programs have been sponsored by the Committee, with the help of the AEC, to acquaint police officers, sheriffs, civil defense personnel, firemen, and highway patrolmen with the fundamentals of handling radioactive materials and methods of coping with emergency situations. This program, it is believed, is especially important for the state because of the everincreasing traffic in radioactive materials.

Report By: Dr. James A. Lane, Directors' Staff, Oak Ridge National Laboratory,
Oak Ridge, Tennessee

For: Mr. Victor S. Johnson, Jr., Nashville, Tennessee

There have been several note-worthy developments in nuclear energy in Virginia or by Virginia industries during the past year.

Perhaps the most spectacular milestone was the completion by the Newport News Shipbuilding and Dry Dock Company of the world's first nuclear-powered aircraft carrier and the world's largest ship. This ship was turned over to the Navy last fall. This company has completed three nuclear-powered submarines and has eight more under construction. A "nuclear related" vessel, a Polaris submarine tender, is nearing completion and will undergo sea trials this summer.

The Atomic Energy Division of Babcock and Wilcox Company located at Lynchburg is another of Virginia's major nuclear industries. Some of its activities have been outside the state, but originated at Lynchburg. The Consolidated Edison Thorium Reactor at Indian Point, New York, is undergoing mechanical tests and should be in operation this summer. This 250,000 kwe pressurized water reactor with oil fired superheater was designed at Lynchburg and the core was fabricated at the Nuclear Facilities Plant and tested in the Critical Experiment Laboratory, both at Lynchburg.

The reactor plant of the N. S. Savannah, the world's first nuclear cargo-passenger ship, was designed at Lynchburg, and the core built and tested in the Lynchburg facilities of the Company. This ship was transferred in February from Camden, New Jersey, where it was built, to Yorktown, Virginia, for its nuclear tests. It has successfully completed its first sea trip under nuclear power and is currently undergoing full power sea trials.

Babcock and Wilcox has just announced plans for construction at Lynchburg of a Nuclear Development Center which will consist of a test reactor, a multicurie hot laboratory and a nuclear-fuel development laboratory. This facility will enable the Company to enter all phases of fuel manufacture, reprocessing and refabrication of reprocessed fuel.

On March 22 Babcock and Wilcox announced before the Joint Congressional Committee on Atomic Energy that it is prepared to offer a 400 mwe spectral shift control reactor central station plant at a fixed price and guarantee 6 mil electricity cost. Such a plant would be designed at Lynchburg and the core manufactured and tested there.

The Advanced Test Reactor to be built at NRTS in Idaho is being designed in Lynchburg. The Lynchburg plant is manufacturing several cores for the U. S. Navy. Several million dollars worth of research, development and advanced design effort are being supported at Lynchburg by the government. These efforts include nuclear heated thermionic converters, experimental determination of resonance integrals, etc.

Virginia Electric and Power Company is a member of the group currently constructing a nuclear power plant at Parr, South Carolina.

On the education side, Virginia has been very active. Both the University and Virginia Polytechnic Institute have extensive programs of graduate education and research. The University has a 1 megawatt swimming pool reactor and VPI a training reactor. A summer institute in nuclear engineering and science is being conducted this summer by the University of Virginia in cooperation with the Roanoke City Schools. Both the Medical College of Virginia and the Medical School of the University of Virginia have active programs of therapy, training, and research in the use of isotopes in medicine.

Dean Lawrence R. Quarles
School of Engineering
University of Virginia
Charlottesville, Virginia

